APRIL
1956

- "2YY" TRANSMITTER
- HOME-BUILT DX RECEIVER
- VOLTS, AMPS. AND MAN
- HINTS AND KINKS

Amateur Radio

WIRELESS INSTITUTE OF AUSTRALIA

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Power Transformers, 40 Ma., 250-0-250., 6.3v. 3 amp., new, 15/-

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2208.1 Kc.	6450 Kc.	7032.6 Kc.	7120 Kc.	8171.25 Kc.
2218.7 Kc.	6850 Kc.	7035 Kc.	7121 Kc.	8176.923 Kc.
3382.5 Kc.	7004 Kc.	7040 Kc.	7125 Kc.	8182.5 Kc.
3500 Kc.	7005 Kc.	7042.65 Kc.	7126 Kc.	8183.5 Kc.
3535 Kc.	7010 Kc.	7045 Kc.	7130 Kc.	8317.2 Kc.
3600 Kc.	7010.7 Kc.	7047 Kc.	7134 Kc.	8320 Kc.
3625 Kc.	7011.5 Kc.	7050 Kc.	7140 Kc.	10.511 Mc.
4285 Kc.	7011.75 Kc.	7052.5 Kc.	7145 Kc.	10.515 Mc.
4495 Kc.	7012 Kc.	7063 Kc.	7150 Kc.	10.524 Mc.
5050 Kc.	7016 Kc.	7064 Kc.	7156 Kc.	10.530 Mc.
5300 Kc.	7018 Kc.	7068 Kc.	7162.5 Kc.	10.5465 Mc.
5360 Kc.	7021 Kc.	7072 Kc.	7163 Kc.	10.556 Mc.
5456 Kc.	7021.5 Kc.	7073.5 Kc.	7174 Kc.	12.803 Mc.
5530 Kc.	7021.715 Kc.	7075 Kc.	7175 Kc.	12.915 Mc.
5700 Kc.	7024 Kc.	7077 Kc.	7725 Kc.	14.322 Mc.
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APRIL — — — — 1956
Vol. 24 No. 4

MSS. and Magazine Correspondence should be forwarded to the Editor, "Amateur Radio," C.O.R. House, 191 Queen Street, Melbourne, C.1, on or before the 8th of each month.

Subscription rate in Australia is 12/- per annum, in advance (post paid) and A15/- in all other countries.

Wireless Institute of Australia (Victorian Division) Rooms' Phone Number is MY 1087.

THE CONTENTS

AMATEUR RADIO
JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

Published by the Wireless Institute of Australia,
C.O.R. House, 191 Queen Street,
Melbourne, C.1.

EDITORIAL

★

INTRUDERS IN THE AMATEUR BANDS

There is no need to ask the Amateur Service in Australia whether it has listened to the interference on the 20, 40 and 80 metre bands—and even the 15 metre band—during the period since the re-licensing of Amateurs after World War II.! The commercial intruders into the portions of the frequency spectrum specially allocated to the Amateur Service on a world-wide basis by decisions reached at the International Telecommunications Conference held at Atlantic City in 1947 and subsequently ratified by all signatory Nations at a Conference in 1952, is enough to drive the DX Amateur and Short Wave Listener—and even the 40 and 80 metre rag-chewer—to the proverbial drink!

The Wireless Institute of Australia, along with other member societies of the International Amateur Radio Union, has consistently brought the matter to the notice of the country's Administration — in Australia, the Postmaster-General's Department, in the United Kingdom the British Post Office, in the United States of America the Federal Communications Commission and many other Authorities in various countries of the world whose official representative signed the agreement to the Frequency Table laid down at Atlantic City. What a futile effort it has turned out to be!

The Amateur Service has a mere slice of the relatively vast frequency spectrum available to short wave broadcast. Manual A1, Automatic A1 and other transmissions, yet the encroachment into the meagre Amateur bands has to be heard to be believed. Why is it that these Commercial vagrants can on the one hand sign an agreement to a Frequency Table based on world-wide requirements, and on the other hand violate the agreement insofar as the Amateur allocations are concerned? The Amateur Services of the world would like to know the answer to that question!

However, the Amateur Service can do something vital about it and it is high time they did. The Atlantic City Convention set up one clear channel for complaints of violation; **the user of a Service being interfered with must register his protest with his own national administration, which in turn files a notice of violation of the treaty with International Telecommunications Union and with the administration having jurisdiction over the illegally-operating stations.** There is no alternative procedure. While international organisations may be invited to take part in discussions of I.T.U. committees and study groups, they have no other official status with I.T.U. Only signatories to the treaty —Governments—can demand action of any kind.

The International Amateur Radio Union states emphatically that member societies should repeatedly protest the presence of intruders to their own telecommunications authorities. Reports should be as complete and correct as possible, and **should demonstrate that the Amateur Service is being interfered with**; the presence of a non-Amateur station in the band does not constitute violation of the treaty in itself.

The Amateur Service has as much right to preserve its domain as any other Service. If the Amateur strays from his allocated frequency bands he is dealt with by his Administration in no uncertain terms. Yet fifty confirmed foreign transmissions have encroached on the Amateur bands and simply nothing is done about it. The Australian Amateur is strongly recommended to forward in those complete reports and the W.I.A. will take stern steps this time to see that something is done about it.

Next month "Amateur Radio" will print the first official listings extracted from the documents of the International Frequency Registration Board at I.T.U. Headquarters in Geneva of known "foreign" transmissions in the Amateur bands. These are only for the period November, '54, through to July, '55. What a deplorable sight it is too!

Of course it must be remembered that some of the interfering stations —all of which have not been confirmed in this list—originate in countries who were not signatories to the Atlantic City Frequency Table. Little assistance can be hoped for from the Administrations of these countries, but if half of those in the list were removed our bands would be more habitable. It's up to each and every Amateur to do some real logging, screening out image reception, unconfirmed reports and reports of stations operating legally under the treaty. Go to it!

FEDERAL EXECUTIVE.

The "2YY" Transmitter

(VK2YY is the call sign of the Radio Section of the Leichhardt Petersham Technical College)

BY N. S. BEARD,* VK2ALJ

AT the first full-scale meeting of the Television Interference Committee of the N.S.W. group of the W.I.A., under the chairmanship of Dr. R. Black, VK2QZ, it was determined that with the advent of t.v. it was necessary to design a suitable transmitter to replace the older type rack-and-panel or assorted bread-board types said to be still in use. It was therefore moved, and seconded, that the two technical officers of the group—VK2OT and VK2ALJ—be requested to design and produce a transmitter to the following specifications:—

- To operate on all licensed Amateur bands, 80-40-20-15-10 metres, the input to be the full licenced power of 100 watts at maximum loading.
- To be capable of either c.w. or modulated output.
- V.f.o. controlled, with calibrated dial on all bands, to conform to present-day Amateur practice.
- Entirely self-contained in the one "dust-cover," fully screened and shielded so that the harmonic output was negligible (especially above 30 Mc.), and therefore suitable for use in close proximity to any t.v. receiver and, if possible, near any standard broadcast receiver with zero interference.

After a short conference, the "2YY" transmitter was designed, laid out, and built to its original design, with one minor modification—that is, the addition of a heavy duty handle at each end, one for the op. and one for the XYL.

It was decided to develop the rig around the readily available "Geloso" v.f.o. unit, which seems to fill the bill nicely as a reliable compact driver, and to use either a single 6146 or two parallel 6146s in the p.a. stage. For harmonic suppression, the p.a. tuning is a pi-network, which avoids plug-in coils and can be band-switched.

Output is taken through a suitable aerial coupler, via a low pass filter when required, and loads into either an end-fed long wire or feeders at practically any impedance.

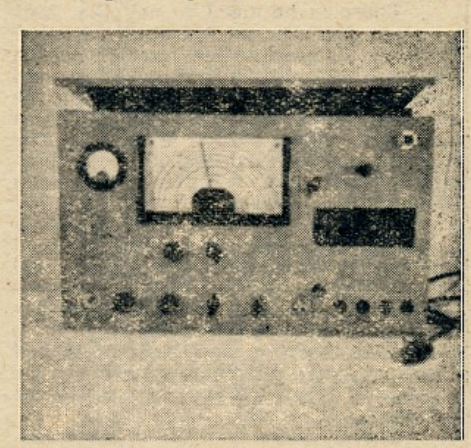
To avoid radiation of p.a. harmonics, or oscillator fundamental, the whole r.f. section, including the v.f.o. unit, is totally screened in a perforated metal enclosure, giving ample ventilation but a complete blockage of radiation except through the output co-axial cable. The v.f.o. cannot be heard in the receiver for "netting" unless a section of hook-up wire is pushed through a convenient hole in the screen and brought over to the receiver.

V.F.O. UNIT

The Geloso unit consists of a band-switched Clapp oscillator using a 6J5, followed by a 6AU6 isolator and a 6V6 buffer-doubler—on 21 Mc. it is a tripler.

With 350 to 400 volts supply, the 6V6 develops up to 8 Ma. drive on the p.a. grid—provided it is lined up after installation.

The only modification found necessary was on the 7 Mc. band. It was reported from various sources that the original layout gave trouble, having the oscillator on 7 to 7.45 Mc., the 6AU6 as an aperiodic amplifier, and both 6V6 buffer and output stage also on 7 Mc. It was



decided to shift the L2 jumper on the oscillator selector switch to place the oscillator on L3 (3.5 to 3.6 Mc. as for 14 and 21 Mc. range), doubling in the 6V6 to 7 Mc.

This necessitates a recalibration of the 7 Mc. dial scale to match up with the 14 and 21 Mc. markings. Some hand cleaning compound on a well-chewed match stick removed the original scale, which now reads 7.0 to 7.2 Mc., giving better bandspread on our most crowded band.

POWER AMPLIFIER STAGE

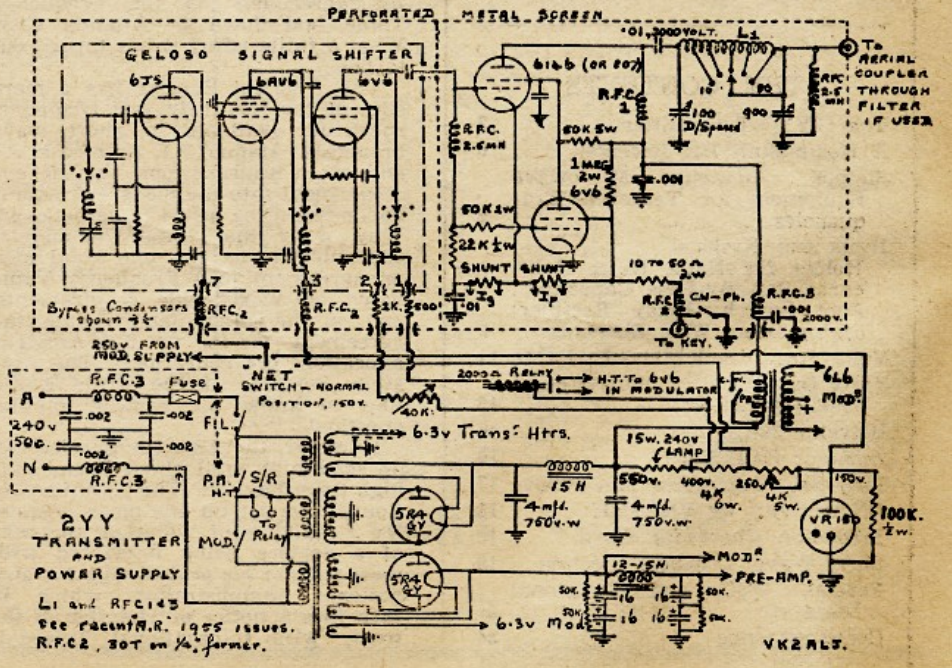
The grid circuit was wired to take paralleled 6146s with 25,000 ohms of grid resistance. The 6146s loaded to at least 99.5 watts for c.w. work, but for phone work one 6146 was removed (after it cooled down!) and the remaining tube loads to about 85 watts input—a slight overload—but was backed off to about 75 watts after checking the price of the tube.

The stage works into a band-switched pi-network, similar to that described in December, 1955, "A.R.," tuned with 90 pF. (max.) input and about 1050 pF. (max.) variable condensers. The input condenser needs to be double spaced to avoid arc-over, as the r.f. peak here on modulation is probably up near 2,000 peak volts.

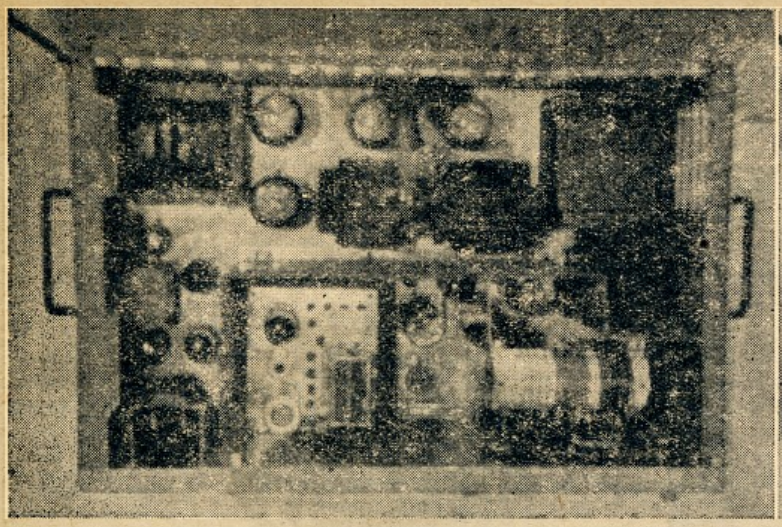
The output condenser can be a three-gang b.c. receiver type (all sections in parallel), and does not arc over when aerial is connected and properly adjusted, but will do so without load.

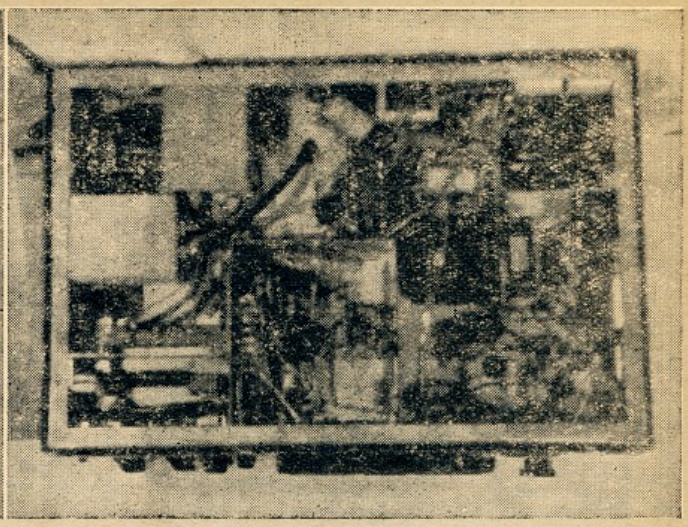
For c.w. work, the oscillator and buffer run continuously and the screen of the p.a. is held down by a 6V6 clamper tube. The circuit used is from "Radiotronics," October, 1951—with a modification as the 6146 screen current is about 12 Ma. per tube, against about 8 Ma. with 807s.

The keying is clean and no back wave is audible with the key up.



* 4 De Chair Road, Dee Why, N.S.W.





MODULATION SYSTEM

The rig is plate and screen modulated using a conventional speech amplifier, crystal mike to 6SJ7 pentode, 6SJ7 triode amplifier, 6V6 driver, transformer coupled to push-pull 6L6s in Class AB2. Bias for the 6L6s is taken from a simple bias pack using a disposals output transformer, with the "secondary" connected across the 6.3v. speech amplifier heater supply. This gave about 95 volts a.c. on the primary at about 50 Ma. loading. The bias rectifier is a 6X5 (a 6H6 will do), with the potentiometer set to give about —28 volts on the 6L6 grids. With this type of bias, it is necessary to run the speech amplifier heaters continuously and to warm up the rectifier before switching in the modulators.

In the "2YY" rig, the modulator power supply is on at all times when "phone" is in use and 6L6s draw current continuously. However, the 6V6 and pre-amplifier h.t. is switched by a relay actuated by the driver current of the v.f.o. so that the modulator is inoperative unless p.a. drive is on. The modulator current during stand-by periods was set to about 60 Ma. by adjustment of the bias, to keep the speech amplifier circuit "warmed up."

A "netting" switch was then cut in to take h.t. for the Clapp oscillator, off the modulator h.t. without switching in the p.a. supply. This allows the v.f.o. to be put on any desired spot frequency without the final coming in, using about 250v. from the speech amplifier h.t. supply. No frequency shift was noticed when the oscillator reverts to its 150v. supply when the p.a. is on.

POWER SUPPLIES

One power supply for p.a. using 5R4GY rectifier, 600 volts per side, 200 Ma. transformer. The filter consists of 4 uF. 750v. d.c.w. oil-filled condenser, 150 Ma. choke and another 4 uF. condenser, delivering 560 volts d.c. on full load. To drop this h.t. to 400 volts for the 6V6, a 3,000 ohm 20 watt resistor was placed under the chassis. After noticing the blistered paint on the cabinet, it was replaced by a 25 watt, 240 volt lamp in a socket placed inside the cabinet at the rear, above the chassis, giving reflected illumination to the dial and leaving the heat in the top of the rig, in the ventilation stream. The resistors left under the chassis have lower heat dissipation, dropping the h.t. to 250 volts for the 6AU6, then to 150 volts at the socket of a VR150-30 regulator tube, giving 150 volts for the 6J5 oscillator.

The transmitter heaters and the rectifier heater are from a separate filament transformer, so that the p.a. h.t. is switched on-off in the 240 volt supply to the p.a. power transformer.

The "S-R" switch operates in series with this switch except when using a separate relay, which can parallel this "S-R" switch.

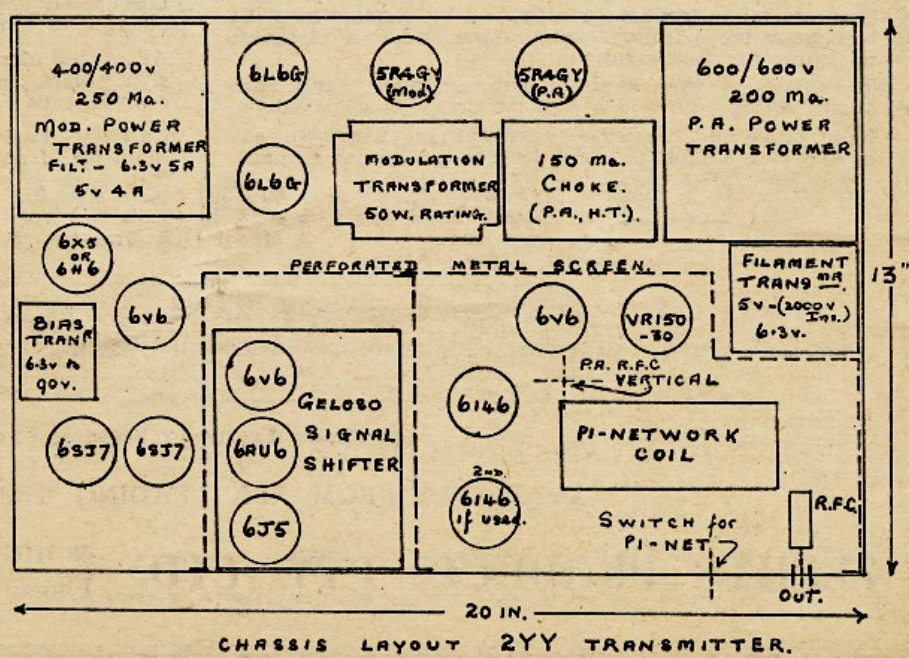
The modulator power supply is standard, 400 volts per side, 200 or 250 Ma. power transformer, plus 6.3v. and 5v. windings. Rectifier used is a 5R4GY, electrolytic input and reservoir condensers, using two 16 uF. 600v. condensers in series for a safety margin. Since the modulators are in push-pull, h.t. for 6L6 plates is taken direct from the rectifier socket at 380v. d.c. and a small 60 Ma. choke is sufficient to smooth out h.t. for 6L6 screens and the pre-amplifier driver stages.

Bias for the 6L6s is developed by a separate 6X5 bias pack as previously described.

LAYOUT

The chassis used is a welded sheet-metal box chassis of 20 gauge mild steel bent to a shape 20 inches long, 13½ inches wide, and 4 inches inside depth, with a lip ½ inch wide underneath, all round. In our rig, the chassis was laid out, punched and drilled for assembly, and then cadmium plated.

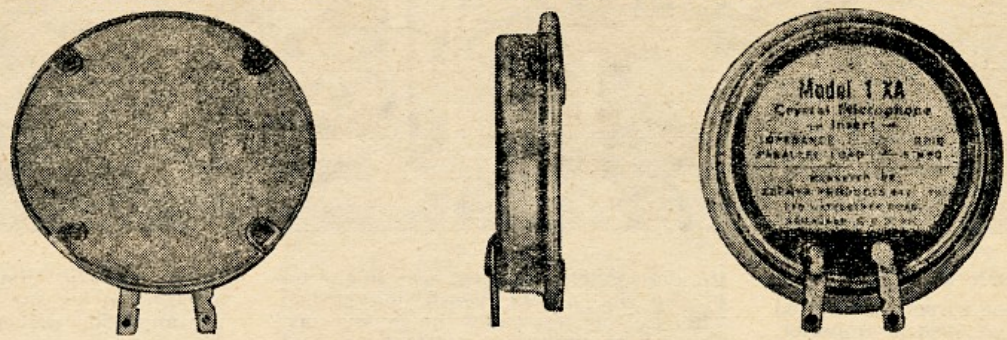
The chassis layout, as per diagram, places the two power transformers at the rear, one at each end, with rectifier sockets and p.a. choke along the back. A slightly different layout may be necessary if the transformers are not of the same make as the "2YY" version. This layout keeps the rectifier and modulator heat away from the exciter and allows ventilation past these heat-producing components. The modulation trans-



CHASSIS LAYOUT 2YY TRANSMITTER.

MODEL "1XA" CRYSTAL MICROPHONE INSERT

AUSTRALIAN MADE — -- FOR AUSTRALIAN CONDITIONS



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- **Patented crystal unit guarantees outstanding efficiency and performance.**
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- **Precision engineering ensures realistic reproduction and high output with long life and dependable operation.**
- **The only unit available with a genuine sintered metal filter.**
- **Good high frequency response ensures excellent speech reproduction.**
- **Aluminium diaphragm mechanically protected and frequency controlled by "Zephyrfil" filter.**
- **Australian made throughout.**
- **Only carefully selected cements used throughout, to suit Australian climatic conditions.**

TECHNICAL DETAILS

Rochelle salt crystal microphones are perhaps the most widely used for all types of service where quality speech and music reproduction at high output levels is a requirement. They are dependable in performance and when fitted with the appropriate "Zephyrfil" filter, their frequency response may be adjusted to suit any application or requirement.

This crystal microphone requires to be terminated with a high value parallel load of the order of 1 to 5 megohms for best results.

The mass of the moving parts is small, hence the sensitivity is high and a high efficiency is achieved.

Light gauge solder lugs are provided so that excessive heat in soldering will not be transmitted to the crystal element.

When mounted in a microphone cage, it is recommended that the insert be suspended in rubber, to eliminate shock and vibration.

One of the connecting lugs is directly connected to the case and care should be taken to solder the metal shield of the microphone cable to this solder lug, keeping the unscreened portion of the centre conductor as short as possible to eliminate hum pick-up.

All crystal elements are mounted on high grade suspension pillars, being fixed thereto with a good quality cement, thus ensuring stability and long life.

Case 1½" diameter (rear), ⅜" thickness, 1-13/16" overall diameter (front) with filter fitted.

Frequency Response = 60-6,500 c.p.s.
Output Level = —45 db (0 db = 1 volt/dyne/cm²)
Impedance = Model 1XA Grid 1 — 5 megohms.

Approximate Frequency Response Curve

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former is necessarily placed against the modulators in a position which allows short leads to the modulator plates, and to the h.t. input to the p.a. enclosure.

A depth of 4 inches allows the audio driver transformer, our modulation relay, and all filter condensers to be placed below the chassis, without crowding or obscuring connections, but no space is wasted.

The signal shifter and the p.a. compartments are formed of perforated mild steel, bent to make a "meat-safe" around the section, with a partition between exciter, and p.a. section. This allows through-ventilation, but seems a good r.f. shield. The lid over the r.f. section is also perforated metal, all fastened with self-tapping screws.

Under the chassis, a single r.f. shield covers the connection, buffer output condenser to p.a. grid, all the p.a. grid wiring, meter shunts, and clamper tube circuitry, with a single entry for the modulated h.t. from the modulation transformer. This lead enters through a feed-thru type condenser, and through an r.f. choke right against this condenser.

All heater wiring into this enclosure is in shielded cable, and is by-passed at the sockets.

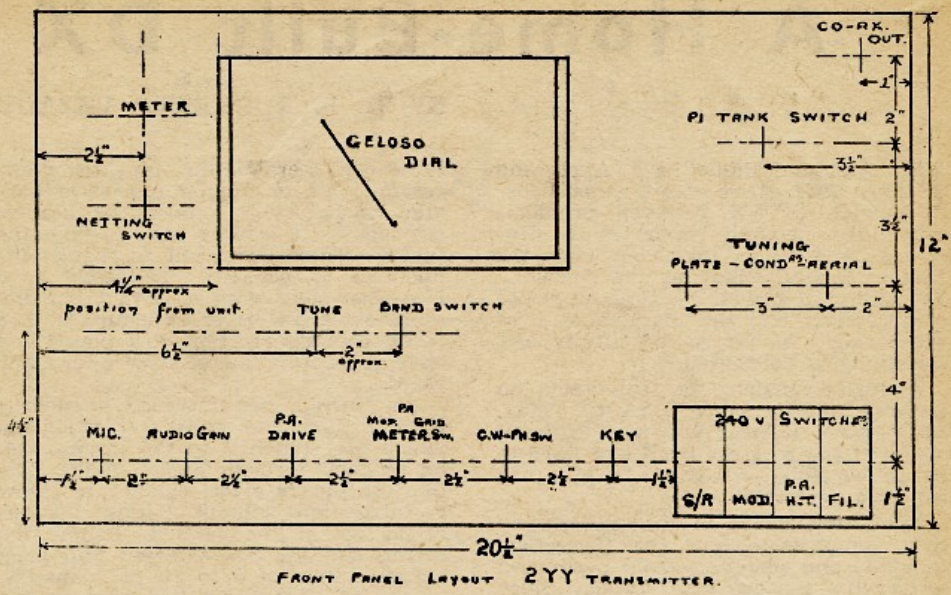
The meter selector switch is in this enclosure, but leads leaving the enclosure are passed through small r.f. chokes and by-pass condensers at the point of entry. The same precaution is taken on the key outlet, the "hot" lead is by-passed and has an r.f. choke in its short connecting lead. By-pass condensers should be of sufficient voltage rating to prevent breakdown with keying surge voltage.

The control switches are small 240v. a.c. architrave switches, fitted into a shielded enclosure with a mains filter fitted behind them. The conductors leaving this enclosure, taking 240v. a.c. to power transformer primaries, need not be by-passed or shielded since no r.f. is likely to give trouble here.

Since the outer cabinet is 12 inches high, the p.a. and exciter enclosure is made 7½ inches high to give as much space as possible for p.a. tube and the pi-filter components. If an 807 had been used, a Geloso tuning unit could have been used here, with the pi-filter coil and its switch as high as possible to allow room for the tuning condensers.

Audio wiring is normal, and forms a straight-through section at one end, working back from the microphone input, to the 6L6 modulators, but leaving room here for the bias transformer. The modulator filter condensers, using two 16 uF. electrolytic condensers in series, each in parallel with 50,000 ohms, are tucked neatly under the rear lip of the chassis.

In the audio wiring the only precautions taken were to see that heater wiring was secured against the chassis, well away from grid and plate leads, and also that the input connection between mike socket and the 6SJ7 grid pin, which is, after all, only a half watt resistor plus its leads, is covered with spaghetti tube, and then pulled through a section of copper braid, earthed at each end. It is surprising how this precaution reduces hum in the modulator output.



FRONT PANEL LAYOUT 2YY TRANSMITTER.

CONSTRUCTION SEQUENCE USED

1. Layout and fabricate the main chassis.

2. On this chassis, place the power transformers, p.a. choke and modulation transformer, signal shifter, bias transformer and the filament transformer.

Check the spacing and mark off their positions. Place the necessary sockets on the chassis near their final positions, spaced to allow room for the tubes, and mark these positions.

Cut out or punch the necessary holes. On the front of the chassis mark out and drill, or cut out, the openings for control switches and potentiometers.

3. Cut the front panel to size, 20½" x 12" high. In our transmitter we bent a lip ½" wide top and bottom to give rigidity, and to form a point for securing the bottom cover and to rest the lid.

Brass is easy to work and can be polished or sprayed. Lay it in place against the chassis and mark out the clearance holes for potentiometers and control switches. It may be secured to the main chassis using the potentiometer and switch shaft, but a separate panel behind it gives better shielding.

4. Mount all sockets and components except the two large transformers and the p.a. choke, and you may proceed with the wiring, etc. If the power transformers are bolted in place it becomes a two-man job to shift it.

5. The Geloso is mounted on a vertical panel bent to shape behind the main front panel, measuring about 16" x 7½" high. This panel is a separate shield, but the main panel bolts to it so that all tuning condensers and most shafts bolt the two together.

6. Mount the pi-network coils and condensers, and then the power transformers are bolted on and wired up. It now weighs about 1 lb. per watt.

7. Finally, fabricate and fasten on the cabinet, lid and bottom cover, at which time the rig is nearing completion.

[Next month the testing and alignment procedures will be featured.—Ed.]

A Home-Built DX Receiver

BY H. F. RUCKERT,* VK2AOU

IN "Amateur Radio" for April and May, 1954, there was a general discussion of DX receiver problems under the heading "Short Wave Receiver Selectivity Problems and the Double Crystal Filter as the Answer." The author described the different stages of a receiver and the characteristics of these stages as far as sensitivity and selectivity is concerned.

A further article, "A Discussion on Receiver Performance," "A.R.," May, 1955, makes it clear why the different stages of the receiver front end have to be so carefully designed to give the expected performance.

The third article of this series may now demonstrate how the theoretical thoughts and planning have been used to design a modern DX receiver. Since the problems have been discussed in the two abovementioned articles in detail, a fairly brief description of the practical work may give enough information to the interested Amateur who still prefers to build his own receiver.

LAYOUT AND MECHANICAL CONSTRUCTION

Three independent chassis are used for the r.f., i.f., and a.f. plus power supply part of the receiver. These chassis are in a shielded cabinet which has a frame of welded angle iron for stability. This method has several advantages. Each chassis does not become too bulky or heavy, and it is easy to get to any component for measurements, aligning work, or repairs. There is also a lot of front-panel space which allows the placing of components at the desirable spots. Each chassis is held by only four screws in the frame. They are interconnected by a six-contact cable so that they can be operated outside the shielded cabinet—important during the developmental time or when repairs may be necessary.

The lowest chassis includes the cascode pre-amplifier, the two r.f. stages, the first mixer and first oscillator, a voltage regulator and the 1 Mc. crystal frequency marker. Looking from the side at the chassis, we see a cross-like section of chassis behind the front panel.

The shielded valves are mainly in the upper front section in the same sequence as the circuit is drawn. The other half of the top section is divided by shields in such a way that a shield is always between the pins of each valve holder so that grid-1 and plate circuits are separated. These small compartments contain only the resistors and most of the ceramic disc-type by-pass capacitors. The r.f.-free end of these small components and leads are soldered to resistor strips. From here a string of cables go down to the other part of the chassis. The solder lugs provide handy measuring points.

The lower front section of this chassis accommodates the two turrets, each of which has three sections for six bands. Each turret has six strips which hold three coils, ceramic disc-type trimmers, ceramic disc or tubular padder or parallel capacitors of suitable temperature coefficient. It is very easy to take the tuning section strips out to change inductance or capacity. The coils have iron dust slugs with a slotted bakelite screw for screwdriver adjustments. The turret contacts are Berillium plated and have given trouble-free service for three years.

The turrets are installed in such a position that the coils and trimmers, which are switched to the circuit, can be reached through a slot in the bottom of the receiver cabinet to allow re-calibration without taking the receiver out of the cabinet. Behind the turrets are the two shielded four-gang air capacitors of 6 to 18 pF. capacity, in one of which only two sections are used. Stators and frame are machined out of two blocks of a light alloy. The rotors are machined too, but they are shrunk on a precision-ground low-loss steatite spindle held by ball bearings.

All the r.f. leads from the valves, the coils and variable capacitors meet at the centre of the chassis cross with very short leads. There are two dials, but the one for the preselector needs only tuning in certain cases. The bands are spread to cover 330° to 350° of the tuning dial. A fine steel cable does the transmission. The tuning knob makes 20 turns to cover the bands and on 14 Mc. about 3/8" on the dial represents 10 Kc.

In the middle is the i.f. chassis which also includes the "S" meter. Underneath this sub-chassis there is only space for small components and the wiring.

The upper chassis carries all the stages which dissipate a lot of heat, like the power supply and the a.f. amplifier, to keep the heat-sensitive tuned circuits cool. There is also a small loudspeaker.

It may be mentioned that all components, except some valves, are of German origin. All coils have been wound by the author because there is no difficulty in doing so as long as one has suitable formers with iron cores.

THE CIRCUIT

A switch allows the connection of the aerial on the cascode pre-amplifier and connects the two 6AK5s (triode connected) to the following superhet. This pre-amplifier is used only if very weak signals on 28, 21 or 14 Mc. have to be received. There is about one S-unit gain in signal to noise ratio with the amplifier on, which is a help in difficult cases. The r.f. gain of the following superhet. can be reduced to prevent cross modulation if strong local stations are near the receiving frequency. If there is heavy QSB the a.v.c. can be adjusted to have control on the two r.f. stages with or without the pre-amplifier connected. These adjustments can be carried out with a 10,000 ohm cathode resistor and a 1 megohm a.v.c. control grid resistor.

One small neutralising coil was found to be satisfactory on all three bands between the two pre-amplifier valves, preventing oscillation and to give good gain.

The five sets of coils of the two pre-amplifiers, the two r.f. stages, and the mixer grid tuned circuits are identical with taps at each coil to provide a transformation of the valve input impedance, to reduce oscillation tendency, and to get the desired band spread for each band. Valve electrodes and the sections of the variable capacitors are on the same taps of the coils.

The tracking of the oscillator was calculated with the slide rule using a method which may be published later in "A.R." The alignment of the tuned circuits can be done with a calibrated grid dip meter. The 1 Mc. crystal frequency marker gives strong harmonics even on 28 and 29 Mc., due to the crystal diode working as non-linear harmonic forming device.

The 150 volt regulator controls the plate voltage of the first two oscillators and that of the "S" meter valve and the mixer screen grid voltage. The stand-by switch has connections to take the B plus off the pre-amplifier and the two r.f. stages when the transmitter is working. This allows me to listen to my own transmission and to see how much of the frequency spectrum my modulation band is covering.

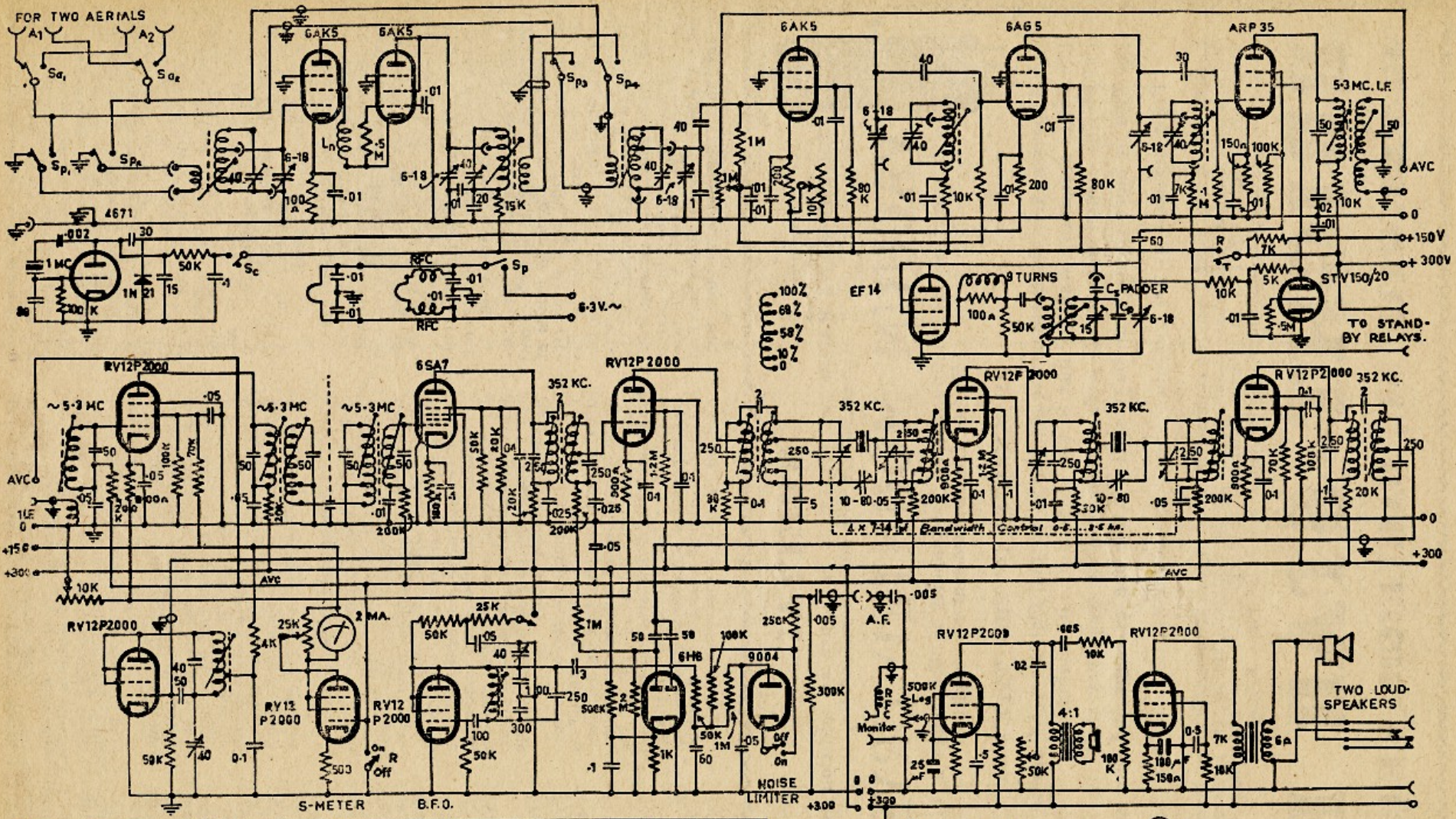
The first i.f. is near 5.3 Mc. and a shielded link line goes to the i.f. chassis from the mixer valve (similar to an EF50 with separate grid No. 3). One valve on the first i.f. is used to separate the two mixer stages and the seven tuned circuits which form a 10 Kc. wide bandfilter with very steep flanks, thus preventing strong signals, which may be twice the second i.f. away from the incoming frequency or first i.f. after mixing, getting through. If these points are overlooked the double conversion superhet. may have more images than a single conversion superhet. Tests with a signal generator have shown that only one frequency is getting through.

The receiver is free from cross modulation if the signals received are not stronger than 3 millivolt or 30 db. over S9 on the 14 Mc. phone band. With an additional cathode resistor the i.f. gain of the first i.f. and second i.f. amplifier can be set to such a value that the mixer noise can just be detected with different settings of the second i.f. selectivity control. This is an important point not often achieved with Amateur receivers.

The tuning of the second oscillator can be adjusted to bring the megacycle marks of the receiver dial always on the dot when checking with the calibrator. It is wrong to use crystal control here because the second oscillator is much more stable than the first oscillator, unless crystals are used as in the Collins 75A receiver.

It is not necessary to repeat here the description of the double crystal filter because all details are given in the April and May, 1954, "A.R." The bandwidth of the flat top of the response curve

* 25 Berrille Road, Beverly Hills, N.S.W.



6AK5	6AG5	ARP35	EF14	4671	STV150/20	RV12P2000
RV12P2000	6SA7	6H6	9004	RV12P2000	RL12P10	RG105

can be continuously varied from 0.5 to 3.5 Kc., which allows the desirable reception of the carrier and one sideband of the phone transmission. The carrier has to be tuned to one side of the i.f. pass band. At 60 db. down the bandwidth is 7 Kc., which is equal to the Collins mechanical filter. One side of the response curve is steeper and the other one is not as steep, as the curve of the Collins filter. A four-gang 7 to 14 pF. capacitor is used for bandwidth control. The single side c.w. reception is very good. S.s.b. reception is also possible without difficulty (switch a.v.c. off, use full a.f. gain, regulate r.f. gain, switch b.f.o. on and adjust carefully to one side of the i.f. passband).

There is a special "S" meter valve. The calibration of the "S" meter is such that 100 microvolts from a signal generator parallel to 70 ohms gives half scale meter reading and is called S9. The step for each "S" unit is 6 db., which is a voltage ratio of 1 : 2.

The b.f.o. frequency is adjustable. This is more flexible in s.s.b. or c.w. work than the crystal control first used.

A 6H6 has the usual function, rectifying the i.f. voltage to get a.v.c. and a.f. voltage. There are three valves of low gain together with nine tuned circuits and two series crystals in the second i.f. amplifier working on 352 Kc. All coils are of the iron dust shell type permeability tuned and wound by the author. Here again only ceramic capacitors, which have a very low power factor of better than 0.04%, have been used. A sketch (shown above the first crystal filter stage) shows the turn percentage ratio for the taps on the i.f. coils of the double crystal filter.

The noise limiter is quite effective, reducing the circuit noise without effecting the audio gain. It is a series diode circuit with automatic adjustment of the level, depending on the modulation percentage (valve is a 9004).

The top chassis accommodates the two stages of audio amplification, the power supply and the loudspeaker. The output valve can be switched off if headphone reception only is desired. The a.f. output valve is capable of delivering 4 watts of audio at 10% distortion. A second speaker can be connected. There is also a tone and a.f. volume control.

PERFORMANCE

With the used carrier plus one selected sideband receiving method, one can hear DX signals without trouble when other local stations were complaining about QRM. With this receiver the internal receiver noise is always less than the noise picked up by the aerial when no signal or static is present. I could always hear the DX stations other local Amateurs copied with similar strength, the only difference is due to various aerials used.

Due to the small capacity of the variable air capacitors of 6 to 18 pF. a very high L/C ratio had to be used, which is much more difficult to stabilise than others with 50 to 100 pF. in the oscillator circuit. But still the warm-up drift is only a few kilocycles, which can be compensated with the second oscillator and the drift changes in direction after 30 minutes of operation.

The "S" meter is calibrated for an r.f. and i.f. gain which reads S1 on receiver noise when the antenna is switched off.

An a.f. output of a monitor may be connected to the a.f. amplifier. The audio response of the a.f. amplifier is so adjusted that low frequencies are attenuated to give the right ratio of low and high a.f. response because the highest a.f. tone allowed to go through depends on the i.f. bandwidth or on the way of tuning in the station.

This receiver was built with no more facilities than the average Amateur has. The only difficulty may be in obtaining the turret. (One should be available soon. Watch for advertisement in "A.R." —Editor).

VALVE DETAILS

The valves used are in some cases German Telefunken types, which can be easily substituted by those locally available.

Type EF14 is similar to the 6AC7 (7 Ma./V. gm., but 5 watt).

Type ARP35 is similar to the EF50 (g3 must be separate).

Type 4671 is a Philips acorn triode.

Type RV12P2000 is a miniature valve with 2 Ma.V. gm.

Type RV12P2001 is similar, but with variable gm for a.v.c. operation.

Type RL12P10 has 9 Ma./V. gm, but is similar to a 6V6.

The RV12P2000 can be used with a.v.c. if g2 has a high resistor.

SIMPLE AMATEUR MICROWAVE EQUIPMENT FOR TERACYCLE FREQUENCIES*

Whilst studying the derivation of the cavity resonator from the simple parallel tuned circuit (A.R.R.L. Handbook, 1953 Edition, page 425) the writer was struck with the possibility of a different development of the parallel tuned circuit, and considered theoretically what might be done with it.

In the ordinary tuned circuit there is both lumped capacitance C, and the distributed capacitance of the coil L. If the coil be made small enough the distributed capacitance, though itself small, may be such in relation to the inductance of the coil that the L/C ratio of the coil approaches optimum for a tank circuit for extremely high (teracycle) frequencies.

Now consider the application of direct current to such an inductor. Almost instantaneously, a counter E.M.F. is developed, which opposes the flow of the applied current. If the coil has some resistance, a sufficiently small inductance, and the correct L/C ratio, such that the time interval between the application of the direct current and the development of the back E.M.F. is of the order of the time of a half-cycle at the resonant frequency of the coil, electromagnetic oscillations will be set up and will continue while the original current is applied. C.w. transmissions can be achieved merely by keying the applied d.c.

Experimental work with such an arrangement led to ultimate success, although it was found necessary to mount the coil in an inert atmosphere (or in vacuo).

A simple parabolic reflector was found to give a good beaming effect.

No experiments with modulation have yet been conducted by the writer.

With two such transmitters, and using simple receiving apparatus which followed conventional practice for such frequencies, two-way Amateur communication has been established over more than one mile.

Communication is, however, restricted to line-of-sight.

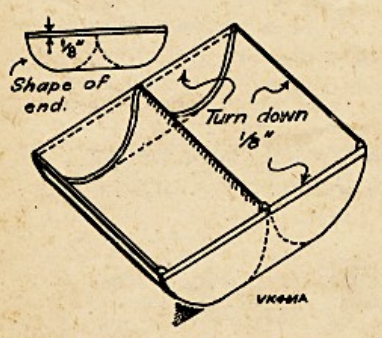
* Specially contributed to this number of "A.R." by a VK6 Amateur, whose name has become detached from the mss. during transit.

HINTS AND KINKS

HOLDER FOR NAILS, NUTS, BOLTS, ETC.

XYL! Spare that jam tin! The OM will make a handy holder from it while he reads his neighbour's mail.

Use a patent opener to remove both ends of a jam tin or a fruit tin. Draw a line directly opposite the folded seam to mark the position of the new fold. Now cut along one side of the seam, smooth the thick side with a file, and turn down about one-eighth of an inch along the other side. Fold the halves outwards at the marked line and, standing the whole thing vertically on another piece of tinplate, mark a boat-shaped outline, leaving an extra one-eighth inch along the top, for turning outwards. Using this as a template, make a duplicate for the other side.



Now solder up the job as shown. This is more easily done if you "tack" the two ends and the pointed middle section first. For tin-plate, resin-cored solder is ideal, and finally, a coat of enamel will prevent rust.

Several of these units could be joined together side by side to make a sectioned tray, their round shape proving a decided advantage when picking up small nuts or quarter watt resistors.—VK4MA.

V.H.F. BY-PASS CAPACITORS

Do not throw away Atlas 30-40 watt fluorescent light starters. Open them up and remove the 0.006 uF. disc mica condensers. These are ideal for v.h.f. by-pass capacitors.—VK5ZAD.

FOOT SWITCH

For that "break-in" foot switch on your transmitter use a dip-switch from the automobile to operate the change-over relays. Since it is a double acting single pole double throw, it is a cinch. —VK5LL.

RELAY RECTIFIER

If you are looking for a rectifier for your relay supply use that 83 mercury vapour tube that you have discarded from the h.t. supply. The voltage drop is about 15 volts across the tube, so make allowances in the transformer winding. A 16 uF. electrolytic used for smoothing will also provide an initial high current surge to close the relay. The 83 will pass an ampere at the low voltages used without blushing.—VK5XU.

FIXING BEAM WIRE ELEMENTS

For fixing the wire elements into beam supports drill oversize holes and pour in molten sulphur and let it harden. Sulphur melts a few degrees above the boiling point of water (at 114°C.) into a straw-coloured liquid. It has very good insulating properties.—VK5XU.

A P.M.G. team securing an underwater cable on the shore of Apollo Bay, Vic.

Miles Turned into Minutes

Almost 40 million words were received by cable in Australia from overseas last year.

Birthday greetings . . . wedding congratulations . . . news that you were glad to hear, or news which made you sad. They all were vital links in the pattern of living.

All over the world, telegraph and cablegram messages have removed international barriers and have reduced miles to minutes.

Leakage Prevented. It is a never-ending task to keep millions of miles of cable lines working efficiently.

Shell scientists have discovered that a casting resin* derived from petroleum can be used for cable splicing.

Treatment with this SHELL product seals cables completely and the seal does not deteriorate.

**Epikote Resin*

VOLTS, AMPS. AND MAN

MAN'S CONTACT WITH HIS ELECTRICAL ENVIRONMENT

PART ONE

BY ROBERT H. BLACK,* M.D.

In this article an attempt has been made to sketch the various ways in which man may come into contact with electricity in his environment.

IN the first place, early man was much impressed by lightning and fear of this phenomenon is still widespread in modern times. Although lightning has now been explained in physical, in place of supernatural, terms its targets appear to be chosen in a somewhat promiscuous fashion. The accompanying thunder does much to heighten the fear and uncertainty of those who are affected by this natural phenomenon: the victim of the lightning stroke cannot find much comfort in the explanation that the stepped leader came near to the earth in his vicinity. Again in nature, the electric fish and rays are interesting curiosities rather than a serious threat to human life.

The deliberate application of electric currents to man are exemplified by judicial execution in this way and by its use to treat mental illness. These two uses have provided some information for the understanding of the phenomena which occur when man accidentally comes into contact with industrial supplies of electricity.

It is surprising that the number of deaths from accidental contact with industrial supplies has not increased in step with the increased use of electricity in the home and factory. Much of the credit for this is due to the awareness of the problem on the part of manufacturers of electrical equipment. But the number of deaths is not inconsiderable and there is much room for improvement of preventive measures, such as the use of low voltages for electric hand tools and early education and supervision to prevent those deaths due to carelessness, ignorance and overconfidence.

MAN'S CONTACT WITH ELECTRICITY IN NATURE

Lightning

Man's first contact with electricity in nature was probably his experience with lightning. Some of the oldest records of this contact were found in the ruined cities of the Tigris and Euphrates dating back to 3,000 or 4,000 years B.C. and in these the destructive nature of lightning is portrayed.

In many parts of the world lightning has been attributed to a supernatural origin. The ancient Greeks regarded it as an activity of Zeus who, however, would sometimes lend a thunderbolt to a member of his family—as when Pallas Athene borrowed some of her father's lightning to transfix Ajax. The Romans considered that death from lightning was a punishment from Jupiter and the victims were buried without their just funeral rites.

In ancient Egypt the god Seth hurled the thunderbolt; in Norse legends it was the god Thor. Early statues of Buddha show him carrying a thunderbolt with prongs at each end. David the psalmist called upon Jehovah to use his lightning to scatter and destroy the enemy.

In France there was a superstition that people who had been struck by lightning and recovered had for 40 days the power of curing all kinds of diseases by touching the body of the afflicted person. It is also recorded that during this period they touched his pocket as well.

Amongst the Bantu tribes of South Africa the belief is held that lightning is produced by a magic thunder-bird, Umpundulo, which dives from the clouds to earth and whose vivid plumage and beating wings give rise to the flash and thunder. Damaged trees are the evidence of its claw marks.

In Europe and England it was for many centuries the general practice from the time of Charlemagne to supplement prayers for protection against lightning by the vigorous ringing of church bells to ward off the demons of the air. The bells were consecrated for this purpose—among others. Whenever a thunderstorm threatened, the bell-ringers were called to the church to ring peals. Before they were equipped with lightning conductors churches were, of course, frequently struck by lightning and the mortality amongst bell-ringers was high. It was reported in 1874 that in 33 years lightning had struck 386 church towers and killed 103 bell-ringers at the ropes.

With the development of artillery in the 18th century there arose the need to store large quantities of gunpowder in vaults and magazines. The vaults and crypts of churches had long been used for the storage of weapons and food and, naturally, were used to store gunpowder. Their tall steeples and explosive content made churches very dangerous places in thunderstorms, and a number of disasters occurred. In 1769 one hundred tons of gunpowder in the vaults of the church of St. Nazaire, in Brescia, were exploded by a lightning flash. The resulting explosion destroyed one-sixth of the city and killed 3,000 people.

Lightning also struck wooden ships at sea and in 1798 the "Resistance," of 44 guns, was blown up by a lightning flash.

In modern times some apprehension may be felt by passengers in aircraft flying through a thunderstorm; however, all evidence goes to show that the extent of the material damage from a lightning stroke to aircraft made entirely of metal is not usually serious if the metal is well bonded together. Nevertheless, an all-metal aircraft may be placed in difficulties by the effect of the flash on its navigating instruments. The radio communication and direction finding equipment is readily put out of action by the discharge unless it has been well earthed to the main frame of the plane. It is also not unusual for the magnetic compass to become unreliable, either through the direct action of the discharge on its magnet or through magnetisation produced by the heavy current passing through or near steel in the aircraft. At night the brilliance of the flash may temporarily blind the pilot, generally only for a few seconds but sometimes for several minutes. Since the air is very turbulent, there is a risk that the aircraft may be in danger during the period of the pilot's disability and the automatic pilot should be ready for engagement in these circumstances.

The infant colony of New South Wales met with early misfortune when several sheep, brought by the first fleet, were killed by lightning while sheltering under a tree during a storm. The first residents in the colony were very much impressed by the large number of thunderstorms. In Australia during the five years 1946-1950 lightning killed 19 males and 2 females, and, in the last few years, we have seen cricket again deteriorate into a blood sport when several players have been struck by lightning in the field as a change from a sharply rising ball on the leg stump.

Many more people are struck by lightning than are killed. On one occasion a church was struck with 300 people in it; 100 were injured and mostly made unconscious, 30 had to take to their beds, but only six were killed.

With lightning stroke the victim usually falls unconscious at once. If he recovers he often suffers from loss of memory for recent events so that he may not remember any impact or, indeed, anything of what has happened. Thus Pliny said that "the man who sees the lightning flash and hears the thunder, is not the one to be struck." Sometimes, however, memory of the blow is retained and the recovered victim may speak of a flash of light or colour, a feeling of a rush of wind, or a blow in the back. Whichever is the case, he frequently discovers a loss of power and sensation in the lower half of the body; he is unable to walk or stand. This effect is only temporary and passes off within about 12 hours.

Lightning often deals violently with its vicitims and the result may resemble that of an attack by thugs. The clothes may be completely torn off and the boots ripped, bones may be broken and burns inflicted. Metal articles of the person become magnetised and may cause impressions of their outlines to be formed on the skin. A forked or arborescent pattern often appears on the skin.

Nothing was known, or even guessed at, as to the true nature of lightning until 1708 when Wall called attention

* VK2QZ, 2 Yerton Ave., Hunter's Hill, N.S.W.

to the similarity between it and the sparks drawn from rubbed amber. In 1752 d'Alibard and also Franklin drew sparks from aloft during thunderstorms. In this way it was proved that a flash of lightning was merely a particularly large and powerful electric spark, and nothing so romantic as a bolt from Jupiter or Thor.

The nature of lightning has prevented the making of experimental observations of its effects on animals. In the middle of the 18th century some experiments were made with the electric discharges brought down from the heavens during thunderstorms, using kites and lightning conductors. But experimentation of this kind came to an abrupt end when, in 1763, Professor Richmann, of St. Petersburgh, was killed in his laboratory by a lightning stroke a foot in length which he had brought into his room by a lightning rod mounted on the roof of his house.

Franklin's work resulted in the use of lightning-rods for the protection of buildings. The first of these was installed in Philadelphia in 1753 and in the following year they were installed widespread throughout America; their use spread slowly to England and to the Continent in the following decade. Franklin's work having been received with scepticism by the Royal Society, there was by no means a universal adoption of his method of protection against lightning.

Modern investigation of lightning received a great stimulus with the development of the Boys' lightning camera, invented by Sir Charles Boys in 1902. By a system of rotating lenses equivalents of exposures in the order of microseconds were made possible. Investigations have also been made by using free and captive balloons, aircraft, radar and ground instruments and observing the effects on electrical transmission systems. The mechanism of the lightning flash has been largely elucidated but the method of generation of the charge is not fully explained.

Some quantities may be mentioned to give an idea of the power involved in the lightning stroke which occasionally includes man in its path. The potential difference between the base of the thundercloud and earth just before a flash occurs lies between a hundred and a thousand million volts. The most frequent value for the quantity of electricity discharged in a complete flash is 20 coulombs. Values as high as 160 coulombs have been observed. (A coulomb is the amount of electricity which flows when a current of one ampere flows for one second.) The most frequent peak value for the current in the return stroke (usually from earth to the cloud) is 30,000 amperes, but values as high as 200,000 amperes have been observed. The average value of energy spent in a flash to ground is 5,000 million calories; a cloud giving one flash per every 20 seconds is dissipating electrical energy in the form of lightning at an average rate of a million continuous kilowatts. One flash vaporised the cable of a captive balloon.

This energy is mainly spent in heating up the six inch wide channel of air along which the flash passes. In a few ten millionths of a second the air temperature rises to about 15,000°C. The air in the channel expands explosively, creating very powerful sound waves. The length of the flash varies from about one half to two miles or more.

These quantities make it somewhat doubtful if a direct hit with a lightning stroke is compatible with human survival. The subject who has been described as surviving a stroke, lying bewildered on the ground wondering how his pants and boots were torn off, may have been the victim merely of a near miss.

Indoors in a properly protected building there is little lightning hazard to man if he avoids the telephone and water taps, and earths the radio aerial during a thunderstorm. The most dangerous places out of doors are small sheds, isolated trees, wire fences and hill tops; the safest ones are depressions in the ground, deep valleys, the foot of steep cliffs or a grove of trees.

The Electric Eel

Man also encounters electrical shock in nature from a number of electric fish and rays. The most powerful of these is the electric eel of South America. Although resembling an eel in shape, this fish belongs to an order which includes the carp and catfish. In size it attains a length of three feet and the thickness of a man's thigh. It is a sluggish fish given to lying still in shallow water, rising to the surface from time to time for a gulp of air; it will drown if denied access to air for more than fifteen minutes. The electric organ of this fish develops a shock powerful enough to stun the largest animal.

The fish are eaten by the Indians and Humbolt described their method of fishing for these dangerous creatures. Horses were first driven into the pools to exhaust the fishes' electric power—a process which nowadays might be frowned upon by the A.J.C. if not by the R.S.P.C.A. You can imagine a jockey galloping down the straight whipping the favourite with a nice specimen of **Electrophorus electricus** (the Electric Eel).

In 1841 a live specimen was seen in London by Schonbein. It had lived there for more than a year. When the end hands of a chain of people holding hands were placed in the water containing the fish they all received a heavy shock which made them leap into the air. A spark could also be drawn, indicating the nature of the shock.

Faraday made observations on the electric eel, but it was not until comparatively recent times that accurate measurements were made on the voltages and the power output developed. Peak voltages as high as 650 have been recorded, although 400 volts was about the average reading for specimens 50 cms. in length, at which size they generated their maximum voltage. Eels 11 cms. long, however, only generated 50 volts. The voltages were measured with the fish out of water using an oscilloscope. The discharge occurs in pulses and the whole electric organ does not discharge simultaneously. The power output out of water was determined by measuring the voltage developed across a resistance: the maximum external power was found to be about 40 watts; it may be somewhat higher. An exhausted eel may have its voltage reduced by as much as one-third and will not discharge as frequently as a fresh one. Even exhausted eels are handled carefully with thick rubber gloves in the laboratory.

The electric generator of these fish is made up of a large number of units. If the organ acts like a set of batteries in series, it is calculated that each of these units produces 100 millivolts per cell or an electromotive force of 10 volts per centimetre of electric organ.

The structure of the electric organ represents modified muscle tissue. The average electrical power which it can continue to deliver over any considerable length of times does not appear to be greater than the mechanical power developed in a muscle of the same size. The speed with which the peak power is obtained is doubtless much greater in electric than in muscle tissue.

THE DELIBERATE APPLICATION OF ELECTRICITY TO THE HUMAN BODY

No electrical apparatus capable of producing currents strong enough to kill animals was invented before about the middle of the 18th century.

Priestley in 1767 killed kittens and dogs with the discharges from condensers and tried, without success, to resuscitate a kitten by artificial respiration, distending the lungs by blowing with a quill into the wind pipe.

In 1775 Abildgaard killed cocks and hens by passing the discharge from a Leyden jar through their heads. He resuscitated fowls, which would otherwise have died, by discharging a second Leyden jar through their bodies. One such cock, resuscitated by this counter shock, recovered with such rapidity that it flew away, scattering apparatus and Leyden jars in its flight.

Brodie, 1828, spoke of restoring to life guinea pigs apparently killed by electric discharges by means of perseveringly inflating their lungs by bellows.

Richardson used a large induction coil, in 1869, which gave sparks up to 29 inches in length, but these could produce no fatal effects unless reinforced by the use of Leyden jars.

Many experimenters have tried, unsuccessfully to electrocute frogs. The frog survives electric shocks and the prolonged passage of 10, 100, 1000 volts and more. On the other hand the dog can be killed by an alternating current of 15 volts or 60 milliamps applied so as to pass largely through the heart muscle for a few seconds only.

It is quite apparent that the results of animal experiments cannot be applied directly to man. Nevertheless, having regard to some of its remarkable manifestations it is not surprising that electricity became to be regarded as a "vital" force and it has been used on numerous occasions in an attempt to cure many of the ailments of man. A great deal of charlatanism has been associated with this use of electricity, as in the case of electric belts in connection with which the public was informed that electricity is life; any beneficial effect from these belts was due to faith and warmth. More reputable uses of electricity in the treatment of disease have been in the stimulation of nerves to secure muscle contraction, and indirectly as electromagnets, x-rays and diathermy.

More recently, electricity has been used very extensively in the treatment of mental diseases; but, before this sub-

ject is examined, the use of electric currents for the deliberate killing of man deserves some attention, even if it merely serves to emphasise the fact that electric currents can be lethal.

Judicial Electrocution

Electrocution is a portmanteau word coined in the United States of America in 1892 to describe execution by electricity. This form of judicial execution was introduced with the intention of making death more instantaneous and more merciful than hanging on the gallows. It first became lawful in the State of New York in 1888 after 19 animals, including bulls, horses, calves and dogs had been killed in the presence of an Advisory Commission appointed by that State. One William Kemmler was selected as the first criminal to be executed by this means and, after the validity of the law had been upheld in the State and Federal courts, he was executed in 1890.

The introduction of this method of execution resulted in a great deal of controversy, both in America and the United Kingdom. Electrocution was held to be a cruel and unusual punishment violating the constitution. It was frequently stated that the shocks merely stunned the criminal who then suffered death at the hands of the doctor performing the post mortem examination which the law required to be carried out immediately after the execution. Thomas Edison was amongst those who considered that this method of execution was no more humane than hanging. This controversy lasted for 20 years or more, but the method was adopted by other States in America and is in use at the present time.

There may have been no doubt about the effect of the first fall of the guillotine blade, but there was probably some experimentation required before the technique of hanging was perfected. Certainly with electrocution the early executions were of an experimental nature although four which were reported from Sing Sing prison at New York in 1891 were described as being a "triumphant success."

It was one thing to kill a horse or a bull or a calf with electricity and another to ensure that a human had been painlessly and effectively brought to the end of his days. Various suggestions had been made about the voltages and currents to be used, and the methods and sites of application to the body of the criminal. There was some difficulty in killing the first criminal, Kemmler, but even three years later, difficulty was still being experienced in obtaining the desired result. On July 27, 1893, W. G. Taylor was placed in the electric chair and 1260 volts were applied for 52 seconds. Taylor was apparently dead for the next 20 seconds; then he gasped. An attempt to turn the current on again failed; the victim's circulation and breathing recovered and he began to move. He was taken from the chair, given a large dose of morphia (three quarters of a grain), and then chloroform and ether were administered. When anaesthetised he was returned to the chair and the further application of 1220 volts for 40 seconds proved to be effective on this occasion.

Eventually the execution machine came to consist of an alternating dynamo capable of developing 2,000 volts, a "death chair" with an adjustable head rest, binding straps and adjustable electrodes. The criminal to be executed was firmly strapped into the chair and electrodes were secured to his head and the calf of one leg. The voltage, current, time of application, and number of applications were subject to variation, but in one reported case 7 amperes were passed at 1500 volts for a total of 70 seconds. This is a somewhat large quantity of electricity and it is estimated to be sufficient to raise the temperature of a 10 stone man by 5°F., apart from the heat generated by muscle contraction. Indeed, the temperature of the bodies executed in this fashion often rises to near 130°F. within 20 minutes and there is in many cases coagulation of the muscle protein: the "hot seat" has apparently been truly named.

Electroconvulsive Therapy

In 1935 von Meduna reported his attempts to treat one of the mental disorders (Schizophrenia) with artificially induced epileptic convulsions. His reasons for using this method were, firstly, epilepsy and this mental disorder were usually antagonistic to each other, and secondly, the symptoms of the mental disease disappeared at least temporarily after spontaneous convulsions. Drugs were first of all used to cause the convulsions but more recently these have been replaced by the use of electrically induced convulsions. Electro-convulsive treatment is now widely used for other mental disorders. It may be stated here that the mode of action of this treatment is apparently as little understood as is the cause of the mental disorders themselves.

The machine used to induce these convulsions consists of a source of current alternating at 50-60 cycles with means for measuring and regulating it, together with a time switch calibrated in tenths of seconds. The electrodes, well moistened with saline, are applied to either side of the head using electrode jelly to reduce the resistance.

The effects produced depend upon the applied voltage and, naturally, the current flowing between the electrodes. Potential differences below 50 volts applied for one tenth of a second may not lead to unconsciousness, but rather cause violent giddiness and nausea. The application of between 50 and 70 volts for one tenth of a second leads to unconsciousness without producing convulsions. By increasing the voltage the stage of unconsciousness is followed by a convulsion. If the voltage is increased still further the period of initial unconsciousness is progressively shortened and finally becomes unmeasurable.

It is usually possible to produce a convulsion with a voltage of between 70 and 130 applied for from 0.1 to 0.5 second. By using a surge current recorder the actual amount of current passing during this treatment was found to range between 200 and 1600 Ma.

When this treatment was being developed preliminary measurements of resistance were made with a 1 milliamp. current passing through the head. The readings ranged from 200 ohms to several thousand ohms, varying with the patient and in the same patient on different days. This measurement has since been discarded as it gave no useful indication of the current which would subsequently produce a convulsion.

Naturally, a preliminary examination is made to ensure that the subject is physically fit for this form of treatment and there have been but few fatal casualties—the death rate being about 6 per 10,000 treatments in a series collected in the United States of America.

(Concluded next month)

6252 (QQE03/20) DOUBLE TETRODE

The 6252 (QQE03/20) is an indirectly heated r.f. double tetrode for use as Class C amplifier at frequencies up to 600 Mc.

GENERAL DATA

Cathode: Indirect, oxide coated.

	Heater sections in Parallel	Series	
Heater voltage	6.3	12.6	V.
Heater current	1.3	0.65	A.

Capacitances:

per system	in push-pull
Ca = 2.0 pF.	Co = 1.3 pF.
Cg1 = 6.5 pF.	Ci = 4.0 pF.

Amplification Factor (each unit):
Grid No. 2 to grid No. 1, 8.5.

Mutual Conductance (each unit):
At anode current of 40 Ma., 2.4 Ma./V.

Mounting Position: Arbitrary.

Cooling: Temperature of seals, 180°C. max. Generally natural cooling is sufficient with:—

Va = 600 V. up to 150 Mc.
Va = 400 V. up to 250 Mc.
Va = 300 V. up to 400 Mc.

Above these limits or with high ambient temperatures, it may be necessary to direct an air flow of about 15 cu. ft. per min. on top of the bulb to keep the seal temperature within the stated limit.

Size:
Overall length 79 mm. max.
Seated length 70 mm. max.
Diameter 47 mm. max.

Base: Septar.

Socket: 40202.
Pin 1—heater.
Pin 2—control grid of unit No. 1.
Pin 3—screen grid (both units).
Pin 4—cathode and beam plates.
Pin 5—heater mid-tap.
Pin 6—control grid of unit No. 2.
Pin 7—heater.

H.F. CLASS C TELEGRAPHY

Operating Conditions (two units in p.p.)

Frequency	200	200	200	200	Mc.
Anode voltage	600	400	300	200	V.
Screen voltage	250	250	250	200	V.
Cont. grid bias	—60	—50	—40	—30	V.
Anode current	50*	50*	50*	50*	Ma.
Screen current	4	4	4.5	4	Ma.
Control grid current	0.7*	0.3*	0.3*	1*	Ma.
Anode input	30*	20*	15*	10*	W.
Anode dissipatn.	9*	7*	5.5*	4*	W.
Screen dissip.	1.0*	1.0*	1.1*	0.8*	W.
Driving power	1.5*	1.15*	0.75*	0.5*	W.
Output power	42	26	19	12	W.
Efficiency	70	65	63	60	%

* Per Section.

Frequency	400	400	400	600	Mc.
Anode voltage	400	300	200	300	V.
Screen Voltage	250	250	200	250	V.
Cont. grid bias	—50	—40	—30	—40	V.
Anode current	50*	50*	50*	50*	Ma.
Screen current	3.0	3.0	3.3	2.8	Ma.
Control grid current	1.0*	1.0*	1.2*	0.6*	Ma.
Anode input	20*	15*	10*	15*	W.
Anode dissipatn.	9*	7*	5*	9*	W.
Screen dissip.	0.75*	0.75*	0.66*	0.7*	W.
Driving power	2*	1.5*	1*		W.
Output power	22	16	10	12	W.
Efficiency	55	53	50	40	%

* Per Section.

H.F. CLASS C FREQUENCY TRIPLER

Operating Conditions (two units in p.p.)

Frequency	66.7/200	133/400	Mc.
Anode voltage	300	300	V.
Screen grid voltage	250	250	V.
Control grid bias	—180	—180	V.
Anode current	2 × 45	2 × 45	Ma.
Screen grid current	2.5	2.8	Ma.
Cont. grid current	2 × 1.0	2 × 1.2	Ma.
Anode input pow.	2 × 13.5	2 × 13.5	W.
Anode dissipation	2 × 9.5	2 × 10	W.
Screen grid dissip.	2 × 0.63	2 × 0.7	W.
Driving power	2 × 1	2 × 2	W.
Output power	8.0	7.0	W.
Efficiency	42	35	%

H.F. CLASS C ANODE AND SCREEN GRID MODULATION

Operating Conditions (two units in p.p.)

Frequency	200	200	400	Mc.
Anode voltage	500	300	300	V.
Screen grid volt.	250	250	250	V.
Control grid bias	—55/—100	—40/—60	—40/—60	V.
Anode current	40*	40*	40*	Ma.
Screen grid current	4	4	3	Ma.
Cont. grid current	0.5*	0.5*	1.0*	Ma.
Anode input power	20*	12*	12*	W.
Anode dissipation	6.5*	4.5*	5.5*	W.
Screen grid dissip.	1*	1*	0.75*	W.
Driving power	2.5*	1.25*		W.
Output power	27	15	13	W.
Efficiency	67.5	62.5	54	%

* Per Section.

5894 (QQE06/40) DOUBLE TETRODE

The 5894 (QQE06/40) is an indirectly heated double tetrode for use as an h.f. amplifier, oscillator, frequency multiplier and modulator.

GENERAL DATA

Cathode: oxide coated, filament indirect.

	Heater sections in Parallel	Series	
Heater voltage	6.3	12.6	V.
Heater current	1.8	0.9	A.

Capacitances:

Ca = 3.2 pF.	Co = 2.1 pF.
Cg1 = 10.5 pF.	Ci = 6.7 pF.
Cag1 = 0.08 pF.	

Amplification Factor (each unit):
Grid No. 2 to grid No. 1, 8.2.

Mutual Conductance (each unit):
At anode current of 30 Ma., 4.5 Ma./V.

Mounting Position: Vertical with base up or down, horizontal with anode pins in one horizontal plane.

Cooling: Radiation. When the tube is used at frequencies above 150 Mc. it may be necessary to direct a low velocity air flow on the bulb and the anode seals. Temperature of bulb and anode seals, 200°C. max.

Size:
Overall length 105 ± 4.5 mm.
Seated length 100 mm. max.
Diameter 49 mm. max.

Base: Septar.

Socket: 40202.
Pin 1—heater.
Pin 2—control grid unit No. 1.
Pin 3—screen grid (both units).
Pin 4—cathode and beam plates.
Pin 5—heater mid-tap.
Pin 6—control grid unit No. 2.
Pin 7—heater.

H.F. CLASS C TELEGRAPHY

Operating Conditions (two units in p.p.)

Frequency	200	250	430	500	Mc.
Anode voltage	600	600	520	500	V.
Screen voltage	250	250	250	250	V.
Cont. grid bias	—80	—80	—80		V.
Grid resistor				20	K.
Anode current	100*	100*	100*	100*	Ma.
Cont. grid cur.	2.5*	2.5*	2.8*	3*	Ma.
Screen current	16	16	18	20	Ma.
Peak grid-to-grid driving volt.	200				V.
Screen dissipat.	4	4	4.5	5	W.
Anode input	60*	60*	52*	50*	W.
Anode dissipat.	15*	17.5*	19*	20*	W.
Output power	90	85	66	60	W.
Efficiency	75	71	64	60	%

* Per Section.

H.F. CLASS C ANODE AND SCREEN GRID MODULATION

Operating Conditions (two units in p.p.)

Frequency	200	Mc.
Anode voltage	450	V.
Screen grid voltage	250	V.
Control grid bias	—100	V.
Anode current	2 × 75	Ma.
Screen grid current	16	Ma.
Control grid current	2 × 2.5	Ma.
Peak grid-to-grid driving voltage	120	V.
Anode input power	2 × 34	W.
Anode dissipation	2 × 9	W.
Output power	50	W.
Efficiency	73	%

L.F. CLASS B AMPLIFIER AND MODULATOR WITHOUT GRID CURRENT

Operating Conditions

Anode voltage	600	450	300	V.
Screen grid volt.	250	250	250	V.
Cont. grid bias	—27.5	—27.5	—26	V.
Load, plate/plate	12.5	10	6.5	K.
Peak grid/grid driving voltage	55	55	52	V.
Anode current	62*	58*	56*	Ma.
Screen grid current	23	27	30	Ma.
Screen grid dissip.	5.8	6.7	7.5	W.
Anode input power	37*	26*	16.8*	W.
Anode dissipation	12*	8.5*	5.6*	W.
Output power	50	35	22.5	W.
Total distortion	2.4	3.1	2.9	%
Efficiency	67.5	67.5	67	%

* Per Section.

L.F. CLASS B AMPLIFIER AND MODULATOR WITH GRID CURRENT

Operating Conditions

Anode voltage	600	450	300	V.
Screen grid volt.	250	250	250	V.
Control grid bias	—25	—25	—25	V.
Load, plate/plate	8.0	6.0	4.0	K.
Peak grid/grid driving voltage	78	76	75	V.
Anode current	100*	97*	94*	Ma.
Screen current	26	28	30.5	Ma.
Control grid cur.	2.6*	2.6*	2.6*	Ma.
Driving power	0.1*	0.1*	0.1*	W.
Screen grid dissip.	6.5	7.0	7.6	W.
Anode input pow.	60*	43.5*	28.2*	W.
Anode dissipation	17*	13.5*	9.7*	W.
Output power	86	60	37	W.
Total distortion	5	5	5	%
Efficiency	71.5	69	65.5	%

* Per Section.

Helvetia 22-Contest

Once again the well known Helvetia 22-Contest is coming up. The Swiss Union of Shortwave Amateurs has scheduled its annual contest for the following date: **1500 G.M.T., 12th May, to 1500 G.M.T., 13th May, 1956.**

The Swiss Society will combine all efforts to give this year's contest a successful progress and invites all Amateurs to take part.

Object: Stations outside Switzerland will try to work as many Amateur Stations in each of the 22 Swiss Cantons as possible.

All Amateur bands between 3.5 and 29.7 Mc. may be used for c.w.—c.w. or voice-to-voice contacts. The serial exchange consists of the usual five-digit (phone) or six-digit (c.w.) numeral, representing the signal report and the number of the contact (RST001, RST-002, etc.). Entrants will use the call "CQ HB" or "CQ H22".

Scoring: Three points are earned for a contact with any Swiss station on each band. The total points earned on all bands are multiplied by the sum of all worked Swiss-Cantons on c.w., voice or both together, on all bands. The maximum multiplier possible, per band, is 44 (22 on c.w. and 22 on phone).

Entries will only be accepted if submitted on separate sheets for each band, using only one side of the paper, and with the declaration: "I certify that my station was operated strictly in accordance with the rules and spirit of the contest, and I agree that the decisions of the Council of the U.S.K.A. will be final in all cases of dispute." (Signature).

Reporting: Reports must be mailed not later than 31st May, 1956, to—U.S.K.A., Box 1203, St. Gallen (Switzerland).

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HOSPITALITY OFFERED

Upon returning to Malaya from leave, Jim Pershouse, VS2DQ, found the Australian Army all around. He will be very glad to offer hospitality, particularly to any who are Amateurs or sons of Amateurs in VK. Perhaps if required, personal contacts could be arranged. He will also help any of the Forces there who would like to apply for an Amateur licence in Malaya. If wishing to visit, etc., please write to J. C. Pershouse, VS2DQ, Baling Estate, Kuala Ketil, Kedah, Malaya.

AMATEUR CALL SIGNS

FOR MONTH OF JANUARY, 1956

NEW CALL SIGNS

VK—

New South Wales

2ZBQ—N. R. Fenton, 500 Cabramatta Rd., Cabramatta.
2ZCJ—J. V. Smith, Farm 937, Griffith.
2ZCL—L. T. McLoughlin, Hunters Valley, Ellerston, via Scone.
2ZCT—K. A. Thomson, 28 Alton Rd., Cooranbong.

Victoria

3ZCH—J. M. Howden, 21 Green St., Burwood.
3ZCO—C. J. Waterlander, William St., Ouyen.
3ZCP—A. D. Pridgeon; Station: "Gretna Green" Nepean Highway, McCrae; Postal: C/o. Telephone Exchange, Dromana.
3ZCT—D. R. Town, Flat 4, 1235 Hoddle St., East Melbourne.
3ZDJ—D. G. G. Johns, Johanson's Rd., South Warrandyte.

Queensland

4ZAG—J. C. E. D'Alton, M/s. 1562, Redcliffe.

South Australia

5ZAY—G. P. Yelland, 19 Lynington St., Tusmore.
5ZBE—R. B. Connor, 60 Matthew's Ave., Seaton.

Western Australia

6ZAH—T. H. Talbot, "Wedderburn," Brunswick Junction.

Tasmania

7AR—A. Doodson, 53 Campbell St., Launceston.

CHANGES OF ADDRESS

VK—

New South Wales

2GM—G. McDowell, Lot 2, Campbell Hill Rd., Chester Hill.
2AAD—R. Hodgins, Donald St., Nelson Bay.
2ABT—B. Ash, Dalgarno St., Coonabarabran.
2AGM—W. C. Berry, 3 Irvine Place, Lismore.
2ALJ—N. G. Beard, 4 De Chair Rd., Dee Why.
2ASO—A. R. Simpson, Box 6, Cremorne.
2ATA—P. A. Tavares, 20 Milford St., Randwick.
2ZAS—S. D. Russell, Lot 14, Dunbier Ave., Lurnea, via Liverpool.

Victoria

3AC—R. Cameron, 54 Hawthorn Gr., Hawthorn.
3AKY—K. W. Young, 179 Ormond Rd., Elwood.
3ALN—A. S. W. Taylor, C/o. L. R. Schultz, 8 Victoria St., Nhill.
3CY—C. Yeoman, 136 Haldane St., Beaumaris.
3EW—E. C. Wheller, 31 Coghlon St., Keilor East.

South Australia

5AF—A. S. Little, Ashbourne Rd., Strathalbyn.
5CT—C. F. Hewitt, 39 Stanley Ave., Blair Athol.

Western Australia

6AY—A. V. Tresidder, 176 Coode St., South Perth.
6KX—H. T. Simmons, 143 Bateman Rd., Mt. Pleasant.

Tasmania

7JP—L. J. Durkin, Counsel St., Queenstown; Postal: C/o. P.O., Queenstown.

Territories

1GA—G. L. Apps, Mawson, Antarctica.

CANCELLED CALL SIGNS

VK—

Western Australia

6AR—A. Doodson. Now VK7AR.

Tasmania

7ZAT—K. A. Thomson. Now VK2ZCT.

FIFTY-SIX MEGACYCLES AND ABOVE

Jim Pershouse, VS2DQ, is anxious to receive letters from any Australian Amateurs, particularly in North Western Australia and Cocos, who would be prepared to try 50 Mc. tests with Malaya. One small snag is that in Malaya they are still authorised for 50-54 Mc., so cross-band working would be necessary. He is arranging beam aerials for both bands, but no doubt a single skeleton slot could easily be arranged to cover both. Those interested are requested to write direct to Baling Estate, Kuala Ketil, Kedah, Malaya, and letters will be much appreciated.

NEW SOUTH WALES

The monthly meeting of the V.h.f. Group was held on 2nd March at the Petersham Technical College with 31 in attendance. An interesting lecture was given by Keith 2ZAU on meters and their application. Keith dealt with meters from their earliest form up to the latest types.

Another test was carried out with the Speleological Society during the month to establish whether the signals coming out of the Caves come through the limestone or through the openings. Quite a large number of the Group proceeded to Jenolan for the week-end. The tests were very successful again and much valuable information on the behaviour of 144 Mc. signals in and out of the caves was obtained.

On the week-end of April 14 and 15 the V.h.f. Group are carrying out another test in conjunction with the Search and Rescue Division of the Bushwalkers' Association on 144 Mc. in the Weeny Creek area at Kurrajong. This should prove a very interesting week-end with the walkie-talkie gear much improved since the last bushwalking exercise some twelve months ago. Crystal controlled walkie-talkies have replaced the mod. osc. now.

During the month Ken 2ANU was holidaying at Terrigal and took along his 2 mx portable gear and was heard making several Sydney contacts.—2LG.

VICTORIA

Approx. 30 attended the last fox hunt, this included three from the Geelong Radio Club in Ted 3AEH, Vic Clarke and Les Rice. They made the journey to get some inside information with the idea of starting a similar hunt in the Geelong area. The hunt took the usual form of a tour through the suburbs and the first catch was not made until about a half an hour after the fox 3LN had set off on the run. It was on a very rough track beside the Yarra River near Richmond in a spot in which the fox had been feeling very secure. However, a rough track doesn't mean a thing to a hound car as was proved several times during that evening. The second stopping place was beside the Albert Park Lake where several catches were made. The last stopping place for the evening was a little unorthodox. Len had found that the gate had been left open in the pound yard at Maribyrnong so he drove in, shut the gate and impounded himself; after all, it was probably the proper place for a fox on the loose. What fun Len and the Geelong chaps had watching through the pickets as the hounds drove up and down. Eventually 3ARY discovered him.

All then proceeded to the final location at the home of Roy 3ARY for the post-mortem and supper. The chaps all enjoyed seeing Roy's shack, he has an exceptionally nice set-up. 3ALY was the winner, 3ZAA second, and 3ZBU and 3KD third. **Many thanks Roy and Glad** for your friendly hospitality in inviting us to your place. We believe Bill 3ZCM and Rolfe McKellar are planning on building gear for the fox hunts and entering as a team. Leo 3XO also is getting interested and we hope to see him at the hunts in the near future. We would like to see lots more new starters, the fox hunt is a jolly good night's entertainment and well rewards the effort of building up some gear.

Recently members of the fox hunt and V.h.f. Group visited the S.E. Zone to demonstrate the fox hunt to the members of that Zone. A party of about fifty went down from Melbourne. Two short hunts were run and as usual, in the form of a competition. Ray Price, one of our very enthusiastic hounds, was the winner, and for his success was presented with a very nice car cushion by the S.E. Zone. On the return trip to Melbourne most of the chaps worked mobile to complete a most enjoyable outing for the V.h.f. Group and their families.

The second V.h.f. Field Day for the season was not very well patronised as only five stations went out portable. 3ZAD went to Mt. Donna Buang, 3GM was at his usual hunting ground at Mt. Bunninyong, 3LN went to Keilor, 3ZBU went to Mt. Macedon, and 3ARY to Mt. Hickey. 3ARY had a bit of trouble with his gear, but the rest all made plenty of contacts.

The lecturer at the last v.h.f. meeting was Jack 3AZK, who gave some practical demonstrations on commercial v.h.f. mobile equipment. He brought in several taxi radios from various makers and pointed out the advantages and difficulties with each piece of equipment. He also added to the interest of his lecture by giving many blackboard illustrations of the wiring up of various sections and it was noticeable that many of the members were busily copying down the sketches for future reference.

Keep in mind the city-country get-together of the V.h.f. Group to be held on 18th April at the W.I.A. rooms. The V.h.f. Digest is still available to any who are interested, if you would like a copy contact 3LN.

Exceptional conditions have been prevailing on the 144 Mc. band. The VK7s have been coming in very excellently and all stations regularly on the band have been making contacts. Also Fred 3YS has made a contact with 2RS at Albury. A new signal to the Melbourne V.h.f. Group is 3ZCW, who has been working mobile while on a trip to the city. He soon hopes to put up a bigger beam at his home location in Ouyen when he expects contacts with Melbourne will become within the realm of possibility. He has managed to work into Colac and Ballarat. David 3ZAT was very pleased with his mobile rig when he took it with him while spending a holiday at Maffra recently and had many enjoyable contacts. He reports that he heard, from Maffra, 3AKR at Westmere, 3AEB at Macedon and 3RK in Melbourne. Glen 3ZBJ is now on the air from his new QTH in North Essendon, his frequency is 144.23 Mc.—Phyl Moncur.

288 Mc.: Seems that a strange silence has descended on 288 Mc. since the contest closed. George 3GM and Ron made their last visit to Mt. Bunninyong on 12/2/56, stations worked were 3ZAI, 3QQ, 3ZBN, 3MB. Conditions were quite good as 3QO had a two hour contact with Ron, who was using usual 6J6 rig, but had his new xtal rig almost ready, this uses 6AC7 tritet to 16 Mc., 6AG7 to 32 Mc., 2E26 to 96 Mc., and a QQ/20 to 288 Mc. George, 3ZCG, of Leongatha, is a newcomer and has mobile 288 and 144 Mc. gear, he expects to be portable from some of the high spots round Leongatha and also when in Melbourne.

Others on band are 3ZAQ, who has 98 QSL cards and still that 3QO bloke won't come across with a card! 3AUX, who says there are more 2 mx harmonics than real 288 Mc. sigs round his way. 3AAF, who is using a xtal locked 288 Mc. convtr. into a xtal locked 7 Mc. convtr., into a car radio; this limits tuning range so he has four switchable xtals in 7 Mc. convtr. 3ZBN has been re-building gear and antenna and is now using a six el. yagi. 3ZAI has been busy with new convtr. 3ZBD on testing. 3MB at Cheltenham, rare DX, this chap. Listens a lot, but keeps quiet! 3ZAE has been shifting gear and re-arranging. 3QO still punishing the gang and is trying out 17 el. yagis. 3ZAN on occasionally.—3QO.

SOUTH AUSTRALIA

56 Mc.: As yet there is no activity on this band in the city area, however Les 5AX and Comps. 5EF are active in Gawler, mainly using the band for cross-band duplex operation. Ken 5KC, John 5MG and your scribe are at present designing mobile gear for this band in lieu of 144 Mc. Xtal locked converters, 2E26 finals and standard car radio verticals will be the order of the day here. One will be able to contact quite a few of the "DC boys" by listening to their harmonics on 56 Mc. from 7 or 14 Mc. There are, of course, several advantages in going mobile on 56 Mc. compared with 144 Mc. There will be fewer stages in the converters and tx's, increased efficiency, lower losses and increased radiation from the fully extended car radio aerial. A possible disadvantage will be increased auto ignition noise, however this can be taken care of by an effective noise silencer, so be seeing you on 56 Mc. chaps.

144 Mc.: This band has been fairly quiet apart from ignition noises, mixers, etc. Most of the boys are having a spell after a few hectic weeks of activity brought on by the Ross Hull Contest and also the 2 mx mobile craze. However, both have abated and the only stations to be heard these nights are Reg 5QR, Clem 5GL and George 5GB, who are perfecting xtal controlled tx's for 288 Mc.

Neil 5ZAW has been heard on occasions also 5RO and 5EF. Hugh 5BC has been successful in "pushing" a signal down to Mt. Gambier on 144 Mc. At the time of writing Stewart 5MS has a converter only, however a tx is well on the way, I believe. Let me know when it is completed Stewart and I will organise some schedules for transmitting and listening from Adelaide.

Last month Ken 5KC, John 5MG and friend, John Shaw, and 5MT journeyed by separate cars to Cape Jervis for a week-end of shooting, surfing, and eating. Much fun was had by all, as they say. John 5MG had to be towed up a very steep hill by a four-wheel drive vehicle, owing to the fact that his clutch started slipping half way up the hill. I might add that this hill is the steepest hill that I have ever had to drive up.

288 Mc.: As I mentioned before, 5GB, 5GL, and 5QR have built xtal locked tx's and rx's for this band. The tx's consist of standard line-ups using 832s as final amplifiers. Converters I believe consist of p.p. 6J6 neutralised r.f. amplifiers followed by push-push 6J6 mixers and suitable crystal oscillator multiplier chains for injection at the appropriate freq. Bob 5PU and George 5GB are the proud owners of QQE06/40s. Bob intends using his as a final on 288 Mc., the driver tube will be a QQC04/15 straight amplifier.—5MT.

WESTERN AUSTRALIA

Following an invitation from Council, the following members of the V.h.f. Group participated in the radio links for the Narrogin Car Club Reliability Trial—6ZAS, 6ZAT, 6ZAH, 6HK, 6TR, 6AW, 6ZAE, 6ZAQ, 6SJ and 6WJ. Denis and Warren had car trouble and were unable to reach their destination but the remaining boys had a great deal of fun. The enthusiasm of Don 6HK and Syd 6SJ is seen in the fact that they drove 1200 miles to Esperance and back just to operate for 24 hours. We also know who is the "Jonah" with wheel bearings. How many have you done in Don? (It was Syd's car.)

144 Mc.: The Yawn Patrol activities have continued with Don 6DW joining in the net. Weak signals from Albany have been heard consistently in Perth and Bruce Rock. Wally sent his converter to Perth and his own signals have been copied on it from Don 6ZAV's so that when further checks take place on Wally's return from VK3, more two-way QSOs should result. Signals between Bruce Rock and Perth have been consistently good.

Vic. 6VK in Northam has been listening with a super-regen. and has heard 6HK, 6BO and 6ZAZ thundering through. Vic. has a xtal converter underway and a tx should soon follow. Tom 6ZAH has passed his morse and is to migrate to 20 mx. Don't forget 2 mx, Tom! A number of super regens. are likely to appear on 2 mx following a talk by 6ZAA to the Modern School Radio Club. One of the students, Lee Potts, has sat for the L.A.O.C.P. I'll have to be careful what I say on 2 mx now!

288 Mc.: Most activity of the month has been concerned with attempts on the W.A. record for this band (a paltry 25 miles made in 1949). Stan 6ZAS went portable several times and heard 6ZAA from Yanchep (36 miles), but no QSO resulted. Finally Murray 6ZAM and 6ZAA went to near North Dandalup and successfully worked Rolo 6BO and Don 6ZAV (44.0 miles) for a new record. Gear used was 832 xtal rigs, super regens. and 4/4 beams at 6BO and 6ZAV and mod. osc., xtal converter and 5/5 beam at 6ZAM/6ZAA. Further expeditions with xtal gear at both ends is planned. Watch out Keith and Reg, we're after that record also!

Don 6DW has had checks with his xtal converter with Rolo (127 miles) without success to date. Don proposes to double from his 2 mx tx to get on to 1 mx. Finally, new licencees and those interested in v.h.f. Why not build a mod. osc. and super regen. for 288 Mc. and then build your 2 mx gear? It will be handy for checking.—6ZAA.

— • • • —

ARMY SIGNALS CLUB TO OPERATE DURING ANNUAL CAMP

VK7ST, the Army Signals Radio Club, will be operating of an evening while in annual camp between 7th and 21st April. It would be appreciated if Amateurs could keep a look out for VK7ST and give them some contacts. Operation will be on the 3.5 and 7 Mc. bands.

The club is composed of members of the 6th Fd. Regt. Signal Troop in Launceston. Sgt. H. D. Spence (VK7DS) is the Club President and chief operator. The majority of the members are lads doing their National Service and are quite keen.

DX ACTIVITY BY VK3AHH†

PROPAGATION REPORT

3.5 Mc.: As was to be expected this band showed some improvement during the month of February. Good openings were observed when the noise of the season allowed the DX to be audible. The band opened to **North America**, the **Pacific Islands**, and the **Far East** at about 0830z when conditions were suitable.

7 Mc.: Conditions were normal on this band; 90 per cent. commercial c.w. and short wave broadcast stations and not much space for Amateurs. Otherwise, propagation conditions were fair to good. Times were 1900-2100z for **Europe** (short path) with erratic break-throughs over the long path (0700-0830z). **North America**, the **Pacific Islands**, and the **Far East** were workable from 0700z.

14 Mc.: Here conditions were rather poor during the first half of the month, but improved during the latter part. **Europe** and **Africa** were well represented over both short and long paths, peaking between 0700 and 1100z. **North American** contacts appeared to be possible at all times with varying signal strengths. **South American** conditions existed around 0600-1200z.

21 Mc.: Conditions on this band are still somewhat erratic, openings being as usual: 2200-0400z for **North America**, 0100-0400z for **South America**, and 1000-1300z for **Europe**.

27/28 Mc.: This band showed some relatively good openings to the **American continents** (2300-0500z) and **Europe** (1800-2030z).

NEWS AND NOTES

With less than eight months to go, the Olympic Games in Melbourne seem to activate all people connected with preparations for this great event. Some time has gone by since the W.I.A. preparation of Amateur Radio events in connection with the Games were mentioned in this column and, being responsible for W.I.A. Olympic publicity, your scribe feels that this is an appropriate time to summarise activities so far. In order to publicise the Olympic Games and assure world-wide publicity for W.I.A. events in connection with the Games, official letters were sent to 76 foreign Amateur Radio Societies in March, '55.

A number of Olympic Games stickers have been made available by the authorities, although our initial request for Special Olympic QSL cards could not be granted. As long as supplies last, these stickers are available from your scribe. Details of Olympic events to be staged by the Vic. Div. W.I.A. will be finalised within the next few weeks and full information will be forwarded to all Amateurs who notified us of their intention of visiting Melbourne for the period of the Games.

A well known DXer has been honoured by the Southern California DX Club. **John Knight, W6YY**, whose contributions to this column have always been of greatest value, was awarded the 1955 DXer Award for outstanding service to the DX fraternity and excellent DX performance. To us in VK, John is known as a first-class DX operator from 3.5 to 30 Mc.; he obtained our W.A.V.K.C.A. Certificate No. 1 and gained first W place in the VK/ZL Contest 1954 (phone). Congratulations, John, and good hunting.

ZK1BS (ex-ZK2AA) and **ZK1BL** are keeping **Cook Island** on the Amateur Radio map. FG7XA is on 14100 c.w. **ZS9G** and **ZS9O** are active from ZS9. AP2RH is on 14025 Kc. (from W6YY).

VP5RR intends being active for approximately six months (from 3ATN).

LA9LD/P is active from Hopen Island, Svalbard (Spitzbergen) on **3.5 Mc. c.w.** (from NCDXC).

FS7RT is reported to be operating from St. Martin Island, on s.s.b., 14302 Kc. (from 5WO).

CR8SA (14078 Kc. c.w.) and **3A2BF** are supposed to be active (from 3ATN).

It is understood that **CR5JB**, of Mansoa, Portuguese Guinea, is active. Additional means of identification is his c.w. note "resembling a slow buzz saw cutting through West Tennessee swamp cypress" (from NCDXC).

More news from the Northern California DX Club (NCDXC): W5HBM, ex-VQ1RF, is planning another African trip and will go to VQ9 land, probably late 1956 or early 1957. VQ6LQ is also active on the 21 Mc. band.

QTHs OF INTEREST
(from NCDXC, 3ATN, 5WO, BERS195)

FY7YF—Via W4ML.
PZ1LL—Box 848, Paramaribo, Netherlands Guiana.
VP8BK—Via N.R.R.L., C/o. LA1RC.
CR6CW—P.O. Box 1400, Luanda, Angola.
FB8BR—Box 730, Tanarive Madagascar.
Ex-ZC5CT—15 Western Rd., Brentwood, Essex, England.
VS9AS—Alan Swindon, P.O. Box 1245, Aden.
VQ5EK—Box 1803, Kempala, Uganda.
3V8AB—19 rue Junon, Carthago.
VQ2IM—Ian McGregor, Box 841, Lusaka, North Rhodesia.
EL1FI/MM—QSL via A.R.I., S. Paolo, Milan, Italy.
ZE1JG—Via Box 2377, Salisbury, Sth. Rhodesia.
VP5RR—Via W5HVV, Box 954, State College, Mississippi, U.S.A.
ZE6JT—David Harris, 30 Stanley Ave., Salisbury, Southern Rhodesia.

ACTIVITIES

3.5 Mc.: Frank **2QL** heard ZK1BS and KH6, and worked Ws*. Jack **6EJ** follows with VS1GX*. **3AHH**'s log contains a series of Ws*.

7 Mc.: Laurie **2AMB** reports ON4NAU*, VE2LI*, VE7ABI/VE8*, and DL9RK, YU3AJK, KX6AF, KC6AB, KG6GX. Fred **3YS** worked VE1ZZ*. Ray **3ATN** phoned with **VQ4AQ*** and Ws*. **6EJ** keyed with VS1GX*. **Dave Jenkin** heard CO3HD, DU7SV, JA5AK, JA3SP, KM6AX, VE3BCU, VE7ABI/VE8.

14 Mc. c.w.: **2QL:** VP6UN*, LU9ZB*, CX-2BP*, FB8BR/Comoro*, NY1PM*, and ZP9AY, OX3AD, MP4TAA, VQ5GC. **2AMB:** LU9ZB*, LU1SE*, LU4HU*, PJ2CJ*, LU4GM*, VP6GT*, and CO3YP, CR7AJ, EL1FI/MM, EA, FB8BR/FB, XE1DA, PA, FU8AA, VQ2GW, VP4LW, VP6DG, VP9CI, VS1, VQ3JTW, ZE1JG, OZ, HB, ZS. Neville **2APL:** CE4AD*, EA*, JA*, G*. Alan **3CX:** FW8AB*, EA8BF*, FB8BR/FB*, YA1AM*. Jack **3JA:** OZ*, LU5AQ*, LU4FDQ*, VP9BM*, VP6UN*, DU*, FO8AN*, EA*, PA*, LA*, F*, YU*, OH*. Stan **3TE:** CN8MX*, CO2OM*, DL/DJ*, EA*, F*, G*, HB*, HP1EH*, I1BNU/Trieste*, I*, LA*, ON*, OH*, PA*, SM*, VQ8CB*, VS2*, YU*, ZC5GN*, 4S7*, 4X4*. Lee **3XO:** JA*, LU*, KV*, DU*, CO*, SM*, PA*, EI*, CR9*, G*, VU*, DL*, FB8*, VQ4*, YU*, KJ*, KR*, VS1*, HB*, OZ*, VP9*, CR6AI*. **3YS:** F*, VQ6LQ*, G*, PA*, and YV1AD, HC-1LE, FO8ANN, VP6GT. John **3ZC:** TF5TP*, FO8AO*, JA*, Europeans*, KR*, ZC4IP*. **3ATN:** ZD6BX*, YJ1RF*. Syd **4SE:** 4S7*, ZS*, VS2*, JA*, KA*, AC5PN*, OA4AU*, OA4J*, LU5AQ*, LU1SE*, YV5FV*, VS6*, VR3B*, FY-7YF*, KZ5CS*, DL*, PA*, SM*, KP4ACM*, I*, KW6*, KR*, VS4BD*, ZD6BX*, CR7AH*, PJ-2CJ*, IT1TAI*, OH*, YJ1DL*, ZE4JK*, FB8ZZ*, and TI2AB, HK4DP, PY2BAU, VP5BE, FO8AG, OE, FW8AB, EL1FI/MM, EL2D, VQ8CB, TF5TP, VQ6LQ, HZ1AB, ZD4BQ, OA4AW, LJ, LE, ZE1JQ, VQ2IA, CR7AD, YI2AM, PZ1BS, HB, CE4AD, EA7CA, FB8BR/FB. John **5HI:** I5RFX*, HB*, CT*, G*. Ray **5RK:** VS2*, VS6*, VU*, KR*, I*, 4S7*, VP7NG*. Austin **5WO:** FO8AN*. **6EJ:** AC5PN*. CO2BM*, CR7IZ*, DL*, DU*, EI9Y*, F*, FB8BX*, FB8ZZ*, G*, GD3UB*, I*, I1BNU/Trieste*, HB*, IT*, JA*, MP4QAL*, OD5LJ*, OH*, ON*, SM*, VS1*, VS2*, VS4NW*, VS5BS*, VS6*, VS9AS*, VQ6LQ*, YA1AM*, YI2AM*, ZC4IP*, ZE3JL*, ZE6JU*, ZE5DE*, ZE5HO*, 4S7*, 4X4BX*. **WIA-L3019:** DL, F, PJ5AN, PZ1WK, G, HB, JA. **BERS195:** CR9AE, CM9AA, DU, FA8IH, FB8BR, FB8ZZ, FK, HZ1AB, IS1, KJ6BN, ST2NG, VQ2IM, VQ4AO, VQ5GC, VQ6LQ, VQ8CB, VS4NW, VS9AS, YI-2AM, YV5BJ, ZD6BX, ZE1JG, ZK1BS, ZS, 4S7EM, SM, EL1FI/MM, PA0GKW/Air Mobile. **Dave Jenkin:** TI2PZ, KZ5MN, KG4AC, VS6, KV, VS2, FO8AN, 4S7, CE4AD, FG7BB, YV1AD, OE, YJ1DL, LU1NE, DU, HB, JA, ON, F. **3AHH:** G*, DJ*, VS6*, LU0AAW*, HB*, EA*, and ON*.

14 Mc. Phone: **2AMB:** ZK1BL*, YV5AB*, YV-5DL*, OA4AW*, OA4CK*, I*, EA*, and ZK1BS, HP1CC, VS6, KP6AK, ZM6AT, OA4DR, OA4AX, HK5ER, XE2KW, OE. **3JA:** GM*, G*, OZ*, LA*, VS1*, YV5BS*, ZK1BL*, YJ1RF*. **3ATN:** VK-1AWI*, EN6AR*, Europeans*, EA8*, ZS*, ET-3LF*, KP4ADX*, VP7NK*, AP2U*, AP2C*, ZS3Q*, VQ4*, ST2*, VP5RR*, and FP8AP. Bram **5AB** (forwarded by **3JA**): CN8*, VQ6*, EI*, ZS*, G*, M1B*. **5HI:** CO8GM*, ET2MZ*, VQ-2JB*. **5WO:** YS1MS*, 9S4AD*, VP5AK*, VP-5KJ*, YV5FL*, CT*, 4X4*, EI*, ZS*, HP3FL*, VP7NS*, YV5DL*, HC1FG*, CE2CO*, PY2CK*, VQ4CT*, CN8MM*, ZK1BL*, VP1EK*. **WIA-L3019:** CT3AN, SL, 4S7, ZK1BL, VE, DL, SM, OZ, 3V8BB, VP7NG, HH4MV, VU, I5REX, VS1, G. **Dave Jenkin:** LU7DX, PY3AGZ, G, LU8AQ, CT, F.

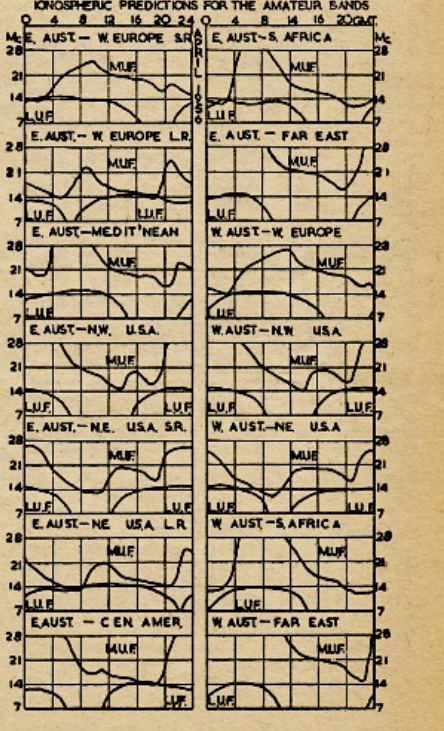
21 Mc.: **3JA:** PY1JY*, KZ5DK*, CE1AJ*, OH*, SM*, G* and other Europeans*. Percy **3PA:** CO*, HC1FS*, HC1ES*, VP6GT*, VP6FR*, VP6WR*, VP6NC*, VP6GC*, VP6TR*, KZ5CP*, KZ5DK*, ZP9AY*, YN1CAA*, KV4BB*, LU9-DAH*, LU2QA*, CE1AJ*, ZK1BS*, VE7TB*, ZS*. **5WO:** KV4BB*, KP4AZ*.

27/28 Mc.: Neil **3HG** worked a series of Ws*. Angus 3IY phoned with a series of Ws*, VE4*, KL7*, GD*, VS1GX*, G*, DL*, JA*. **3PA** also worked a number of Ws* and heard KL7 and VE. **3YS** spoke to Ws*, VE7* and KP4GN*. Max **4HD** reported Ws*, VE4*, VE6*, VE7*, XE1FU*, HP1GD*, LU5AE*, LU2DED*, HC1FS*, DU7SV*, KA*, VS2CR*, MP4BBW*, VS1GX*, DL*, G*, LA*, SM*, PA*, HB*, I*, ZB1AJX*, OE* and VQ4FK. **5WO** QSOed with OH* and Ws*. **WIA-L3019** heard Ws. **3AHH** keyed with a number of Ws*.

Rare QSLs were received by: 2QL: FU8 (3.5 Mc.). **2AMB:** KT1WX, ET2IB. **3ATN:** EL2B, FB8ZZ, LX1SI. **4SE:** GM4JQ, YU1AG. **5HI:** EA9DF, OQ5FH, TG9AD, IS1FIC. **5WO:** VP1EK, VQ8AG, VP9BM, IS1EHM. **6EJ:** DU7SV, MP4-BBE, MP4BBF, VP9BM, XW8AB. **BERS195:** BV1US, YJ1DL, YV5DE, ZE6JT, 4S7.

Thanks to W6YY, the Northern California DX Club, and VKs 2QL, 2AMB, 2APL, 3CX, 3HG, 3IY, 3JA, 3PA, 3TE, 3XO, 3YS, 3ZC, 3ATN, 4HD, 4SE, 5AB, 5HI, 5RK, 5WO, 6EJ, and WIA-L3019, BERS195, Dave Jenkin.

IONOSPHERIC PREDICTIONS FOR AMATEUR BANDS, APRIL, 1956



† Hans J. Albrecht, 10 Belgravia Ave., Box Hill North, E.12, Vic.
* Call signs and prefixes worked.
z — zero time—G.M.T.

SHORT WAVE LISTENERS' SECTION*

VICTORIAN FEBRUARY MEETING

This meeting of the Group was held at the rooms on 28th. The first part of the meeting was spent planning details of meetings and activities to be held by the Group in the future. During the course of the meeting, it was proposed that a committee be formed to undertake the organisation of lectures and events, such as visits to places of interest. A motion was put and carried to this effect, and Dave Rankin and Ian Hunt were duly elected in this capacity. Gerry Lane was also chosen to assist in the running of the committee. It was felt that the committee would be useful in taking a burden from the shoulders of the general committee of the Group and leave them more time for administrative duties.

A new member was welcomed to the meeting, namely Lola Burton, who is definitely very keen on short wave listening. Lola, as usual, had a really good log of stations for us. Noel 3ZO was present, busily sorting QSL cards.

A very interesting programme has been prepared for the Group, including lectures from various illustrious personages and visits to places of interest. The visits to be arranged include an inspection of the City West Telephone Exchange, D24, and various Amateur Stations. Further details of these visits will be broadcast over VK3WI and advised at the Group meetings. So come along one and all and find out what it is all about.

The second portion of the meeting was occupied by a demonstration of a c.r.o., with a built-in audio osc., constructed by one of the younger members of the Group. He brought it along without being asked, and we might say now that we don't mind anyone bringing in any equipment they think may be of interest to others. It proved all round to be quite an interesting item and some of the patterns formed looked really pretty.

At the March meeting, Max 3ZS gave a talk on the organisation of the Wireless Institute of Australia. I have heard a rumour that Max may be capable of writing an article on this subject. (Editor please note.)

* Compiled by: Ian J. Hunt, WIA-L3007, 101 Robert Street, Northcote, Vic.

At the April meeting (on 24th), Hans 3AHH will give a talk on Amateur Radio overseas. Hans has first hand knowledge of this subject, and this meeting should be a must for anyone at all interested in radio. All Amateurs are welcome to attend.

The May meeting of the Group is a free night. You may come along just for a ragchew, bring in some kind of equipment you have, show off all the QSLs you have received or bring in your log and work on it. If some Amateur would like to arrive at the meeting with a car full of portable gear, or anything at all, he may. We won't lock any of you out you know. 29th May is the date.

Congratulations are due to our very enthusiastic member, Gerry Lane, who recently broke the distance record for a QSO on 288 Mc. It is understood that his record has since been broken by others, so congrats to all of you. Michael Ide is understood to be moving to a new QTH soon—still in the metropolitan area.

John Wilson was welcomed back to the last meeting. First time we've seen him since the festive season, and he's looking very fit too. Len Poynter seems to have as much energy as ever. Ian Hunt is now the proud possessor of an AMR300 and expects to really hear things. That S meter seems to fascinate him and he swears that all reports will be genuine from now on. We don't seem to hear much from the country chaps, so what about letting us know about some of your escapades.

ANY AMATEUR NEEDING ASSISTANCE?

The Short Wave Listeners' Group would be pleased to hear from any Amateurs who think we may be able to help them in such forms as monitoring transmissions and checking for b.c.i., etc. If you are perhaps going mobile and would like reports on transmissions, just let us know the approx. time and frequency and we'll do our best to be a help to you.

You may also be able to help us, too. If you have any suggestions you think would be of interest, or could come along and give a lecture or demonstration at any of our meetings, please let us know. We would also like to hear from any of you who would be willing to receive a visit of a small number, say six, of s.w.l's. to see your home station. Any ideas along these lines may be forwarded to John Wilson, 37 Rayment St., Alphington, or Ian Hunt, 101 Robert St., Northcote. Ian Hunt may also be contacted by telephone, MY 260, Ext. 526, during the day.

STATIONS HEARD ON THE BANDS

3.5 Mc.: VKs 3AHH, 3ATN, 5MS.

7 Mc.: W6SXI, VK2, 3, 4, 5, and 7.

14 Mc.: FS7RT, AC5PN, FO8AN, CT1ER, KH6AHG, ZK1BL, VE1EI, SM6SA, EA7EM, CE2CO, VR2AG, KH6ZA, KH6NES, FA8CC, W7VMD/KG6, KG6NO, KA5CL, VK9AS, VK-9DB, VK9BS, VS1CZ, G3GJF, KR6OB, DU1CV, HZ1AB, HP3DA, KA2FC, VS2EW, KG6AAY, KC6UZ, KA2KS, VK1IJ, FU8AC, ZK1BS, VR2CV, VR2CS, YV5AB, KR6RK, YV5VK, HK-3FV, KX6BU, FK8AC, VR3B, VE3DCI, 4S7VR, KP4ABD, KP4WD, OE6FJ, ZS3S, W6FWG/KW6, JA6AV, HZ2KN, VS1CZ, VU2AL, EI2W, EA-8BB, HP1CC, G8LG, GM3DHD, CE3PV, KR6RT, EA2CQ, KA2WW, VS2BO, W1, 2, 3, 4, 5, 6, 7, 8, 9, 0, VK1, 2, 3, 4, 5 6 7, 9.

21 Mc.: ZL2MN VK3AKZ, FK8AC, VK2JZ, ZL1OA, K6BHH, ZL3LE.

VICTORIAN DIVISION W.I.A.

★

ALL-BAND SCRAMBLE

The next event will be held on

2nd APRIL (Easter Monday)

★

Let's make this the best Scramble ever!

★

Rules: page 12, Sept. '55 "A.R."

PUSH-PULL POWER

as only these

"Miniwatt" Twin Tetrodes

can deliver!

MINIWATT TYPE 5894 (QQEO6/40)

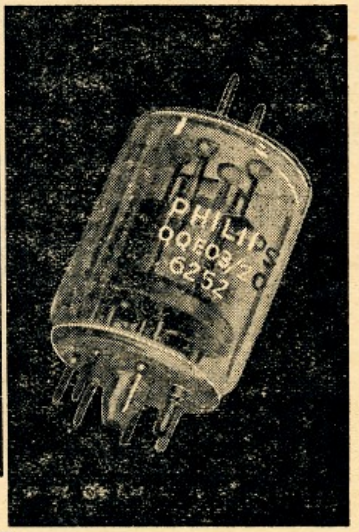
A twin tetrode for wide band operation . . . widely accepted as standard for 420 Mc. service.

New ICAS Ratings up to 250 Mc. Now allowed 750-volt plate voltage for CW operation and 600-volt plate modulated. Designed for R.F. Amplifier, Modulator, Frequency Tripler use. Considerably reduced capacitances provide higher resonant frequencies. Single cathode and screen-grid construction result in low RF degeneration, therefore low drive required. Self neutralized over entire band. 4" high overall x $1\frac{3}{16}$" diameter.

	CCS	ICAS
144 Mc. input	120	150 watts
220 Mc. input	120	150 watts
420 Mc. input	100	120 watts

MINIWATT TYPE 6252 (QQEO3/20)

Lower Input and Output Capacitances than any other comparable twin tetrode.



A natural for 420 Mc. use! Has been successfully operated as a frequency multiplier in the UHF TV band. Particularly suitable for low-drain mobile transmitters and multiplier chains. Only 3" high, with the same mechanical and electrical features that have placed the PHILIPS 5894 in the forefront as standard equipment at 400 Mc. or higher.

	CCS	ICAS
144 Mc. input	90	112 watts
220 Mc. input	90	112 watts
420 Mc. input	75	90 watts

A FULL RANGE OF TRANSMITTING TUBE MOUNTINGS AND ACCESSORIES ARE AVAILABLE

TEMPERATURE MEASUREMENT!

A range of "Tempilstick" crayons and "Tempilaq" paints are also available. These items solve many problems in measuring seal and glass temperatures.

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Miniwatt Division
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PVI8-55

FEDERAL, QSL, and DIVISIONAL NOTES

FEDERAL

FEDERAL COUNCILLORS

Federal Executive has been advised that Mr. J. Coulter has been appointed Federal Councillor for a further twelve months from March, 1956. This means that Jack VK5JD is continuing in the position which he has held with such success during the past years. It is most pleasing to see members willing to place their knowledge and experience at the disposal of the Institute.

It is also noted that Mr. R. Hugo, VK6KW, has again taken over the position of Federal Councillor in the Western Australian Division. Ron's experience will stand him in good stead and all will wish him well for the coming year.

Federal Executive expresses its appreciation of the fine work of Mr. G. Moss, VK6GM, who has carried out the duties of Federal Councillor so conscientiously during the past years.

PACKING OF QSL CARDS

It has been brought to the notice of Federal Executive that due to faulty packing some Amateurs, both here and overseas, have unfortunately lost some, or all, of the cards they have sent through the mail. It is suggested that where a good deal of handling can be expected, members make certain that the cards are packed in such a manner as to avoid the parcel breaking and allowing the cards to be lost.

W.A.C. ON S.S.B.

Interest in s.s.b. continues to grow and the "Calendar" of the I.A.R.U. for December indicates that a certificate is now available. The following excerpt supplies details:

"To stimulate experimentation with single-sideband techniques throughout the world, the Headquarters commenced the issuance of W.A.C. Certificates endorsed for s.s.b., where the cards submitted show clearly that both the candidate and the stations he worked were using such equipment. Member societies ar encouraged to mark applications as being for s.s.b., if there is sufficient evidence on the QSLs submitted to them. To date, ten of these certificates have been issued."

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FEDERAL QSL BUREAU

RAY JONES, VK3RJ, MANAGER

W6ITH and his YL are holidaying on the French Island of St. Martin in the West Indies. He is operating on approx. 14,800 Kc. c.w. and also on phone. He is signing FS7RT and well informed W circles predict that St. Martin will be classified as a new country.

A new certificate promulgated as from 1st January, 1956, is that of W.A.S.P.—Worked All Sicilian Provinces. It is available to licensed Amateurs anywhere in the world. The rules provide that the award will be granted to Amateurs who can prove by confirmations that they have made bilateral communication, after 1st July, 1952, with at least five Sicilian Provinces in any band, phone or c.w., or a combination of both. The Sicilian Provinces are: Agrigento, Caltanissetta, Catania, Enna, Messina, Palermo, Ragusa, Siracusa and Trapani. Claims for the award, together with the necessary confirmations and four I.R.C., are to be sent to IT1TAI, Box 300, Palermo, Sicily.

The R.E.F. is staging a contest during March and April. Unfortunately details were forwarded by surface mail and did not arrive in time for advance publication. The phone section was scheduled from 1200 GMT March 3 to 2400 GMT March 4. The c.w. section is to be held on April 14 to 15 with same hours as the phone section. The group to be exchanged consists of the RST plus a running serial number of the contacts, e.g. 579001, etc. Logs are to be sent to the R.E.F., Box 42-01, Paris R.P., France. Logs are usable for claims for the D.P.F. or D.U.F. awards.

In an interesting letter to Austine, VK3YL, Kidong Kang, who operated HL9AA/Portable during December, 1955, gives details of the expedition for which the station was used. The station was using 15-20 watts and was temporarily licensed for the Mt. Chii climbing party of the Seoul Engineering College. 77 stations were contacted, among them being the following VKs: 5HW, 3ZO, 4SE, 4YP, 4SS, 5MS, 2MT, 6AF, 3ATN, 5WL, 3AHL and 3YL. Kang has received QSLs from 5HW, 3ATN, 5MS and 3YL and he promises to send his card when the annual exams end approx. end of January. His QTH is Kidong Kang, 62-16, 3-KA, Pildong, Seoul, Korea.

Avio, who was signing EL1FI/MM from aboard the flagship S.S. "Failaika" on the voyage from America to Japan, uses 130 watts to a long wire. Tx is a Viking and the Rx SX71. Avio desires all QSLs to be sent either to his home QTH of via Nizza 16, Genoa, Italy, or to the Italian QSL Bureau.

4S7KH, whose signals were consistently sought after on 14 Mc. in 1955, has now returned to G land. He requests outstanding VK QSL cards to be sent to him at "The Poplars," St. Mary's Road, Mortimer, Berks., England.

Further information from Dave Laing, YJ1DL, reveals that he has not been very active due to commercial station work. Dave was due to leave for Tahiti in March for a holiday and while there, he hopes to get on the air as an FO8. He says that a QSL card has been sent to all VK stations worked, but if required, another card will be sent.

Requests for outstanding QSL cards for ex-DL4FS, 3A2AB, LX4FS, KZ5ND and W9SRB should be made to Guy Kane, 1159 Clarendon St., West Sacramento, Calif., U.S.A., who now, as K6AQP, has one of the outstanding W signals on 14 Mc. c.w. band.

Ray Baty, ex-VR3A and VR3D, after having washed up at Fanning Island, has proceeded to the U.S.A. Ray visited W4GD in Tennessee, end of Feb., and continued on to many other States. His itinerary provides a period in England and Italy and he expects to arrive back in Australia end of June.

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FEDERAL AWARDS

W.A.V.K.C.A. AWARD

During the last month a certificate was issued to SM7QY, Gunnar Ekstrom, Gullberna, Sweden.

G. Weynton, VK3XU, Awards Manager.

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NEW SOUTH WALES

SOUTH WESTERN ZONE

For the past few months we seem to have been too late in getting our notes in "A.R." Let's hope we have better luck this time. Don 2RS is very active on 144 Mc., running skeds with the VK3 boys. Don has new 6146 p.a. and 24 el. beam. Not much news from Griffith area, but John Smith has new Z call sign; congrats John. Hear we have a new call at Culcairn.

A meeting was held at Griffith on 11th March to arrange this year's Convention at Griffith. News of what took place next month.

Alan 2SJ has moved into the zone at Finley; welcome to the zone, Alan. 2QD and 2EU (Albury) heard occasionally ragchewing. The Tumut gang have been quiet lately, have heard 2PN on 40 mx occasionally. The chaps at Wagga seem to be very inactive, maybe the fault of the hot weather we are having. What about a signal and some news chaps? Well that is all the news I have at the moment, hope for more next month.—2AJO.

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VICTORIA

The Victorian Division is most fortunate in having obtained the services of Mr. Fred Bail, 3YS, as Honorary Secretary of this Division. Fred's eagerness to do a job and get it done, and his extreme thoroughness, is well known to all who know him personally and the Division should benefit greatly from his services. Already he has been busy arranging the programme for the general meetings for the coming year, which comprises a series of lectures that should prove to be very interesting to all.

April 4.—Annual General Meeting.

May 2.—A lecture by Mr. Wally Hunter, of Zephyr Products, on Microphone Manufacturing Technique.

June 6.—Mr. Campbell, of Masse Batteries, will lecture on the manufacture and care of storage batteries.

July 4.—Mr. Jack Vertigan, 3WR, will lecture on Single Side Band Technique.

There will be two general meetings in August, one on the 1st and a later one on the 29th, this later one will take the place of the September meeting as there will be no general meeting in that month. For the August meetings arrangements are in hand for a lecture by Mr. Alan Foxcroft on Propagation, and for the other meeting a Frogman Lecture. When complete details have been finalised for these two lectures, they will be advertised in "A.R." The Annual State Convention is scheduled for 3rd and 4th November.

At the March general meeting the following were welcomed as new members of the Institute: Messrs. P. Davies, 3APX; G. Hipwell, 3ALR; L. Harding, 3AHL; P. Playsted, 3APH, as full members, and Messrs. R. Lockerbie and F. Featherstone as associates.

The lecturer for the evening was Mr. Kempson, of the Melbourne Technical College Staff, and he lectured on the new TV operators' commercial licence. He also discussed automation and the enormous field in that direction that is opening up for the young men of today and tomorrow. Mr. Syd. Clark, 3ASC, proposed a scheme for a voluntary weekly donation by members to the building fund and suggested a weekly amount of 2/-. This matter was discussed at length and gave the members quite a bit to think about. It was reported that during the Olympics in Melbourne the W.I.A. will hold an Olympic Dinner and arrangements have been left in the capable hands of Max 3ZS. Log Books are still available at the rooms at 4/6 per copy.

Neville 3ACN is at present spending a six months' holiday in New Zealand and is endeavouring to make the personal acquaintance of as many ZLs as he can during his tour of ZL land. Ron 3AHJ, who has recently returned from a mobile tour to VK6, is now working on gear for 21 Mc. and is in the process of building a three element beam for that band.

VICTORIAN ALL-BAND SCRAMBLE

February, 1956, Results

Another Victorian Scramble was held on 6th February, 1956. The winner in Section C was again 3ALY with 16 points, all earned on 144 Mc. Section D was won by WIA-L3015. 36 stations participated.

Section C: 3ALY 16, 3ZAQ 14, 3ZBE 13, 3YS 12, 3XB 11, 3OJ 7, 3ABA 6.

Section D: WIA-L3015 13.

Check logs received from 3HE and 3AHH, who also did the checking.

As mentioned in last month's notes, the next Victorian Scramble will be held on 2nd April (Easter Monday). Let's make this the best scramble ever! Rules of this Bi-Monthly Victorian Scramble can be found on page 12 of "A.R.," Sept., '55. Send your log to the Divisional Contest Manager, W.I.A., Vic. Div., 191 Queen St., Melbourne, C.1.—73 3AHH.

CENTRAL WESTERN ZONE

During the past couple of months activity in this zone has been very limited as far as your scribe is concerned, and I think also, most members seem to be less active during the summer months. This is due, perhaps, to the country members having more work to do harvesting, etc., and the city folk spending the longer daylight hours tidying up the gardens, so getting onto the best side of the XYL. However I guess that from now on we will see more midnight oil burned when the longer nights restrict our outside activities. Chas. 3IB is at present on holidays, which he is spending in Tasmania, so I guess he will come back with glowing reports of the Apple Isle. Harold 3AX is busy building a new v.f.o.; expect he will be catching that rare DX in the near future.

NORTH EASTERN ZONE

Our Secretary, Earle Scones, is working on his BC348. Vern 3AXW, XYL and family have been enjoying a caravan holiday. Ken 3AQG

VK2 DIVISION W.I.A.

EMERGENCY NET FREQUENCIES

7050 and 3575 Kc.

Please listen before using 7050 Kc. as this frequency is very much in use by VK2WI these days.

Thanks, VK2WI.

is now well established on 80 mx. Bruce 3AGG and Brian 3ASF are having some success with the DX on 20 mx. Johnny 3ACK must be still tied up by his commercial operations. Murray 3HZ is moving into a new house in Shepparton, and Alex 3AT is more or less occupied with his professional work. Peter 3APF is often seen about in Shepparton and Ray 3FI is still constructing his shack. Although he is thought to be quite active, there is nothing on the v.h.f. work of Alan 3UI, neither is it known if Keith 3JC has finished his house yet.

Syd 3CI has recently spent a week fishing down at Foster and Des 3CO is still very much on deck. Henry 3HP, like Jack 3PF, is tied up with his RFB VL3 skeds. Frank 3ZU is expected to be going away on leave now. Ken 3KR is able to work in occasional DX on 20 mx. We welcome Keith Cakebread on his qualification to full membership, with Doug Tacey's old call, 3DW, operating on 80, 40 and 20 mx. 3AMZ has got plenty of study and no rig in Wangaratta yet. Hugh 3AHF is using the new crystal microphone on the 20 mx DX. Bill 3JP is building a new garage. Howard 3YV has built a new final pi-tuner for his tx. Bruce 3QC is still on the colour photography and Doug 1IJ is getting in a lot of hiking as well as being DX down there at Macquarie.

[Editor's Note.—Congratulations are offered to Andy 3FD and Nancy upon the arrival, on 29th Feb., of twins—boy and girl. All are doing well, including Andy! The event is a variation of over 100 years of family tradition for both of them, that of raising a family one at a time!]

The sunspots and Aurora Australis have upset our zone operations around 7050 Kc. in late Feb. and early March. Always listen to 3WI for current activities on the hook-up as our Annual Zone Convention should come up soon.

EASTERN ZONE

The demonstration of a fox hunt, which was held at Warragul, on 26th Feb., proved a great success. Visitors from Melbourne were 3ARY, 3OJ, 3KD, 3ZAD, 3IE, 3BZ, 3LN, 3ZBU, 3ZS, 3ZBE, 3ZAQ, 3NY, 3GY, 3XJ, 2ZBY and 3IP. The fox car was Len 3LN who proved to be most foxy in his movements. The base point was Picnic Point at the 54 mile post, and it proved to be a lovely spot. The outright winner was Ray Price with the assistance of Ray 3KD. They combine very well as a team and will be very prominent in these events in the future.

There was a good attendance of local boys, some of whom had gear for 2 mx and they knocked up a few contacts with the Melbourne boys. 3OJ had a collapsible beam, up about 25 feet, which proved to be of great interest to all. Joe 3TO was up on the hill at Yallourn and worked most of the boys from there. The day was a great success and wound up with a picnic tea. We certainly thank the Melbourne boys for providing such an interesting day's entertainment and also the local boys for their attendance. This, no doubt, will be a forerunner of many more fox hunts.

Stations still making an appearance on the hook-up are Bill 3WE, Graham 3QZ, whose XYL is coming along quite nicely; Keith 3SS, who is spending part of his time in Melbourne doing TV course; Ron 3PR, who is always there and a real backbone of the 80 mx hook-up; Ian 3AAV, who is at the moment fixing his car in preparation for his holidays to S.A. and he will be working mobile on 80, 40 and 2 mx. Jack 3AJK is building up 2 mx equipment. Jack had a visit from 3AOE, XYL, and two junior ops. for a week-end and carried out some 2 mx mobile checks with George 3ZCG, who now is a resident of Newborough. Every Sunday night 3ZCG goes up on Coach Road, overlooking Yallourn, to try and contact the 2 mx hook-up.

Come on the hook-ups so that we can discuss preparations for our Convention, which is to be held in Morwell in June this year.

MOORABBIN RADIO CLUB

The club's last tx hunt was held in perfect weather, leaving from the club rooms slightly later than 2 p.m. due to technical difficulties beyond the control of the starting officer. Some 20 minutes later a crisis developed when the potential winner (Bob 3NZ) found himself neck and neck with Jack 3JD. It actually finished a dead-heat, so much so, that the panel beaters are still beating out the results. Burwood Park was the elusive, but not impossible place of hiding; the usual picnic gathering ensued. The club's next tx hunt was held on 18th March and will be covered in the next issue.

On 10th March a very enjoyable social evening was arranged by the club at Bob 3NZ's new QTH. It consisted of a dance—indoors and out, barbecue out of doors, a dart board and quoits filled in any gaps while a monster easter egg was raffled.

GEELONG AMATEUR RADIO CLUB

Ron 3AYB recently gave a detailed instruction on the vagaries of the Geloso oscillator unit. Club members were particularly interested in this talk and they are making a new tx around the same unit. Mr. Geoff Woods, of the yacht "Iola" (all his own building), spent a very pleasant evening discussing the various angles of navigation. Geoff came along with a car load of gear, maps, sextants, etc., and later in the week took members for a sail to prove theory helps practice.

A field night on 80 mx was held—the tx being in the capable hands of Ted 3AEH. The winners, Bob 3IC and Jim 3ZBR, found the tx at Queen's Park. Jim 3ZBR gave an interesting discussion on mobile power supplies. Jim knows this angle of tx well as he does a lot of work on Bush Fire Networks. Members are preparing for the Convention at Warrnambool and hope to have a good muster there.

At a long and weary last, Bill 3AWZ has worked several Melbourne stations on 2 mx—he is looking for 3ZBJ who converted him to those more cultural bands—to work DX? Some members visited Melbourne recently to watch the 2 mx fraternity in action at the evening fox hunts. Three members have gear almost ready to go and others hope to follow soon. Ed 3AKE and Len 3LN will both be pleased at this new activity.

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QUEENSLAND

BRISBANE AND DISTRICT

Another month of 1956 has passed and now we are well into the new financial year, so please forward your subs. so that finances can be squared away in preparation for the year ahead. Your new Council wants to see a record year this time because conditions are getting better and we have heard call signs (VK4) that haven't been on the bands for years. A strange point, in 1946 when the post-war rush to get started, we held our meetings in the State Service Union rooms in Elizabeth Street and what meetings they were! It wasn't unusual to see capacity houses and in spite of the fact that DX was so good, the chaps always found time to attend the general meetings. Maybe the novelty of being back on the bands after six years and wanting to see the gang after such a long absence was the reason for the packed meetings. Maybe it was the Disposals equipment that was so regularly disposed of. The reasons may have been a combination of these two and a wish to have a good "earbash" with the other blokes. All we know is that a lot of us have a yearning for the 1946-1950 enthusiasm again and could be we will get it back again.

You probably noticed in the Federal notes in last month's "A.R.," Prof. van der Pol, of the C.S.I.R., has stated that the sunspot maximum will occur in 1957 and that the sunspot number will be a record high. Now the strange point, at the beginning of the last sunspot maximum we had the State Service Union rooms for our general meetings and now we have them again.

Maybe you are sick of reading our repeated notes on sunspots, but Amateur activity runs hand in glove with conditions. When conditions are good, we have high membership and packed out general meetings, and just the reverse with poor conditions. This year we have nine nominations for Council where the maximum for the last few years has been about six. A lot of criticism has been hurled at the Divisional Council over the last few years, but members who were nominated year after year became frustrated. Gentlemen, those chaps who have been criticised so much have held the Division together in its period of "doldrums" and deserve your thanks. Now we will make a statement which will be scoffed at, but it comes from us in all sincerity.

Council is in office for the benefit of all and not a favoured few, and if you have any requests or complaints you all know the box number. Don't keep your feelings bottled up and develop a complex; let us know what is on your mind and we can do something for you. None of us have the powers of mental telepathy, so let us in on it instead of harbouring a grudge.

Well, after getting that off our chests, we can get down to other things. Firstly, when illness strikes it shows no preference. We had Bill 4YA very ill and now slowly recovering. Another staunch member has been very ill and was able to keep it a secret from most of us. Russ 4PN has been inactive for some time due to illness and not only has the Amateur fraternity been without his company, but the Royal Flying Doctor Service, of which Russ is an important member of the organising brains, has been without his services. Get well soon, Russ.

An old member of the Division and a former councillor who has been inactive for some time was a welcome visitor at the February general meeting. We are referring to Pat 4KB, who was the "prime-mover" in arranging for the new meeting place. Pat is not on the bands at present, but "five gives you ten" that when DX starts getting thick, 4KB will be in there amongst it.

Council received a copy of the new W.I.A. Log Book which has been kept quite a secret by F.E. If you want a really excellent log book, you can now get one here in Australia. Those of us who have been fortunate, in the past, to receive copies of the A.R.R.L. Logbook can now purchase a log book here in Australia which is on the same standard of quality as the imported article. That goes for all of you; details of how to purchase your new log book have been published in "A.R.," so get one right away and you won't be disappointed.

Well we will close this month's notes with another reminder that we want to see you at the State Service Union rooms on the fourth Friday of the month. Please roll up, gentlemen. So 73 from your scribes, 4ZM and 4PR.

MARYBOROUGH

4CB is very pleased at reports of his 2 mx signals being heard in Brisbane (150 miles), up to S3. Archie's tx is not good enough to receive signals from Brisbane, so a crystal controlled converter is planned. Meanwhile, the 16 el. beam has been hoisted higher. 4AI reappeared on 14 Mc. Has acquired a 6146 for the final of his new band-switched rig. Has also built a multimeter, and a 2 mx crystal converter is on the production line. 4GH moved some gear out of his shack and so discovered the whereabouts of his tx. Is still looking for his rx.

4BG re-built his modulators as Class B zero bias and put in a xtal mike. Result is better and deeper modulation. Ron is working on 14 and 21 Mc. phone and c.w. FLASH! 4CB made the first 2 mx Maryborough-Brisbane contact with 4JO at the Brisbane end. Having repeated the contact since, seems to prove that it was the result of a weather front, so regular working is expected.—4BG.

TOWNSVILLE

Very sorry boys being unable to give you any dope of the doings at the meeting held at 4BX's residence on Thursday, 24th Feb., which I missed on account of my mother's funeral. Next meeting will be held on 19th April. Vern 4LK bemoaning the fact he is unable to cross his strawberry plants with blue couch grass and save him weeding the garden. Good exercise Vern! 4UX operated mobile and was in constant touch with northern local boys after leaving Mackay to arriving at Giru. The boys here lost many hours precious sleep listening for you, though you were not heard on the final stretch home. 4DK used the local boys to keep an unofficial watch on the weather to know in advance if the Burdekin River would cover the railway bridge. He is now spending a week's holiday.

4TU hoping to get a mobile rig going in the car. Sure will get plenty of advice from the gang when parked on our lonely beaches. 4GF heard on 7 Mc. calling Claude 4UX/mobile on last lap home; glad to hear you Edgar. 4PS, 4JH, and 4BX getting their heads together on building a prototype set for 144 Mc. band. Remember DX distance for VK4 land is only 113 miles, worked over long week-end during closing days of January and should not be hard to beat. 4SE has over 80 countries worked since August, has the edge on most of the boys due to being well out in the mid-west free from QRM.

Apologies to Hans 3AHH in not sending DX notes, but with sickness, sunspots and wet season, band getting a spell. 4BW has now passed his 800th contact with Harry. Who gives the special party when the 1000th QSO comes up Andy? 4NT has promised notes on doings in the bush but so far the stage coach has not arrived, must be lost in the wilderness. Norm has gone cubicle quad happy and has earbashed all and sundry on antennae for months past, before deciding on the quad. Iris walks around with her fingers crossed. Rex 4LR had assistance from Joe 4JH in moving his gear in anticipation of flood.—4RW.

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SOUTH AUSTRALIA

The Annual General Meeting, held in February, brought a good attendance of members who showed that they were keenly interested in the administration of the Institute. Business proceeded according to the agenda, with the President in the chair; a lot being passed and dealt with as routine items. This year a ballot for Council members was necessary and on the declaration of the poll, Messrs. Austin 5CA,

Barbier 5MD, Bowen 5XU, Brice 5OK, Bussenschutt 5OR, Bulling 5KX, Judd 5HQ, Parsons 5PS, and Vivian 5FO were the successful candidates for office. The President's report has already been published so no details of that. The Treasurer's report was well received and Mr. Sullivan, 5JK, proposed that the usual honoraria be presented to the Secretary and Treasurer for their sterling work.

During "smoko" and completely off the records of course, some remark concerning the number of "B's" appearing on the list of councillors was overheard! Personally, being one, I should say that this is a record—any takers?

A discussion on the merits and short-comings of the Christmas Social took place and the general consensus of opinion seemed to be that the present set-up is satisfactory, with some changes in entertainment, perhaps. The 50-54 Mc., 56-60 Mc. change brought forth much partisanship, but eventually satisfactory explanation came forth and VK5WI still transmits a signal on the 56 Mc. band each Sunday morning for those who wish to find the band!

The retiring President was honoured with life membership in the Institute as a token of the members' appreciation for the work which had been done.

After the distribution of QSL cards the business of the ordinary general meeting was dealt with. One new Associate, Graeme McKellar, was accepted into membership and a resignation from Ralph Taylor received with regret. Very few matters other than routine ones were dealt with and the large body of enthusiasts who had remained throughout set to for a good old "pow-wow."

At the Council meeting held at Goodwood on 6th Feb., the newly elected members chose Mr. John Bulling, 5KX, as their Chairman and President of the Institute for the new term of office. John is electrical maintenance engineer at Osborn (E.T.S.A.) and has had plenty of experience to back him as President of the Institute and we all wish him well in the highest office. Jack 5JD and Brian 5CA fill the offices of Vice-Presidents, with Harvey 5HQ your new councillor, accepting the office of membership organiser. The other officers remain as for 1955-56. Following the decision to increase Council to eleven members, at the Annual General Meeting, another member will be co-opted to bring Council to full strength.

The Hobbies Exhibition is now in full swing at the Adelaide Town Hall and VK5WI is represented with a display of v.h.f. h.f. equipment, loaned and installed by Messrs. Austin, Beasley, Sappiatzer and Bowen. These latter, together with Arch 5XK, Rob 5RG, Associate John Campbell, are doing duty as operators and chief publicity agents. Next year, April, 1957, an Exhibition will be at Wayville for six weeks and the Institute is going to need all hands on deck, so keep the date in mind chaps.

Jack 5JD is again on the high seas (and the higher the better for he left me 12 hours to get these notes written!), I have to glean where he has reaped (or cast where he has fished perhaps would be better) to gather personalities. The T.v.i. Technical Committee met on 21st Feb. and decided on a course of action which includes a series of three lectures at the general meetings. Its members are Ray 5BT (Chairman), Rob 5RG (Secretary and Scribe), Ian 5ZAA, Phil 5ZAD, Des 5DK, Clem 5GL, and Gordon 5XU. By the time this is printed another meeting will have been held at Phil's place on 20th March.

40 mx hasn't been too healthy lately and there is much feverish activity on 20 mx as the sunspots stir up the ionosphere. At the rate that things are going, this peak will go beyond 1946 and appear about August next year. Those interested in assisting with the Geophysical work sponsored by Australia should give their names to the Hon. Secretary as soon as possible.

5CJ has been busy on the shack and should be settled in before the winter; be no excuse then, Col. Claude 5CH has been busy trying to keep up the supply to keep the rest of the gang on the air. These blackouts are no good when you're chasing some rare DX Claude, better have Stuart QRT next time the load gets near the danger point and everything will return to normal. 5MS has been getting results with his converter on 2 mx with his beam perched up some 70 ft., heard quite a few VK3s and several VK5s; wait till you get the tx on Stuart and can work them.

Leo 5ZAG reports that his 2 mx converter is performing well; better hoist your beam up a bit Leo and let Bram know you are about. Bram 5AB is getting stuck into some DX on the lower frequencies, believe he has started an antennae farm up there at Hynam with vee beams several wavelengths long. 5FD still finds no time to throw his switch on. Tom 5TW and John 5JA still not active. John is probably too busy while Tom is saving up for the next R.D. Contest. 5KU is a little more active lately, especially on 40 mx phone working Carl 5SS—a recent new call on the band.

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TASMANIA

As press dead-line will not permit coverage of the meeting to be held in the club rooms on 7th March, the most I can say thereon is that 7GA's lecture on the Hydro Electric Commission's activities should be most appropriate, in view of the fact that the Annual General Meeting and Dinner are to be held at Bronte. As you read this, the Dinner will of course be a thing of the past, but I feel sure that it will still be a memorable event, in keeping with the efforts put into it by Reg 7WN and his aides.

At a recent Council meeting, Doug 7AB was demonstrating the virtues of a well known make of v.f.o. It proved reluctant to give any output at all, mainly because of a switch so recently installed that it was overlooked, but boy, oh boy, when that switch was found, and operated, there was certainly oodles of drive. A burned out meter left Doug darned sorry that he ever found the switch.

7WI now operates on the full 100 watts due to the efforts of Joe 7BJ, who at the present time is on recreation leave. Judging by the number of reports coming back on 40 mx one Sunday, I would say the results certainly justified the efforts, and if results on 80 mx were similarly rewarding, then a long felt want has certainly been satisfied for country members.

I hear that Ted 7FJ has recently taken unto himself a pair of 807s, and since Ted is only a short distance, airline, from me, it looks somewhat as if I am for it at last. Ah well, it was good while it lasted. I definitely saw Max 7ML poring over the coil switching circuit of a proposed rx. In striking a cautious note, I shall only comment to the effect that it certainly augurs well for the future, and the bug may yet get in a good nip in the right place. Associate Johnny Grace seems to be overcoming the various difficulties associated with the construction of sound-on-film reproduction equipment, and the finished product is very nearly ready for presentation. Seems to me that there is good material there for a lecture and demonstration—what say Johnny?

Ted 7EJ has sprouted out on his own in business at Devonport, and we wish you success in your venture Ted. However, don't concentrate too heavily on the receiving side. Associate Vance Tobrman is exploring new pastures and is now allied with a reasonably well known power generating organisation. Do not forget that ticket Vance when you happen to ponder on frequencies over 50. Alan 7CJ now has the poles on hand, and is trying to make up his mind on rhombics, vee beams and the like. Good work, "Al," however pick on something that will allow a little r.f. to trickle down south. An AT5/AR8 combination now graces Bert's (7BC) set up and I understand that he has, more or less, forsaken the v.h.f's. for the time being. Gee, Bert, I thought by now that you would be the 2 mx king on that part of the coast.

Contrary to my forecast, Len 7LS has not yet unpacked the gear at Wynyard. I must have words with Nostradamus on the subject—something wrong somewhere when my prophecy is so much askew. Len 7LE recently took part in a short three act play. Curtain rises on act one to show Len in the shack, entranced by the music made by some invisible force using his antenna set-up for a double-bass. Act two features Len bravely venturing forth to find a horse with one hind leg very firmly entangled with the halyard. Act three shows the escape of the intruder, and the rapid descent of an antenna, associated with a halyard speeding heavenwards. Curtain falls on Len gazing at a point 70 feet high, in an attitude of supplication, with words on his lips that none can hear—but all can guess.

Well chaps, before the fader is finally closed on me, I would like to wish the new scribe good luck with his hunting, and to thank all those who have been such a great help with news items at various times. Cheers all, 7JD.

NORTHERN ZONE

The election of office-bearers for the forthcoming year is as follows: President: G. Kirmsee, 7GM; Vice-President: R. Kilby, 7RK; Sec.-Treas.: H. Solomon; V.h.f. Officer: P. Frith, 7PF; QSL Officer: C. Wright, 7LZ; Zone Correspondent: W. Briggs, 7LX.

Congratulations to Perc. Woodruff who, at long last, received his limited call, 7ZAW, and is at once very active on 2 mx, both with and without the proper radiating system, eh Perc? Our comiserations also to Henry Solomon, who just failed to pass the theory section of the examination, but don't give up Henry, remember the spider.

After a very successful opening to the 2 mx season, Gordon and Peter, 7GM and 7PF respectively, are busy revamping cascode front ends to include the latest in low-noise triodes 6CW7 (ECC84), and both promise good results. Len 7BQ and Col 7LZ and Gordon again have investigated the possibilities of 5 over 5 arrays for 2 mx and appear to like them, as all three have them in operation, so DX on 2 mx for these stations seems assumed.

Believe Bill 7DS is putting the candle beneath the 7 Mc. rig and will shortly be heard on phone. Max 7CA is emitting some queer noises on 2 mx; any leads Max? As also are many super-regen. rx's on the way. Tx hunts are being held while the good weather lasts. Ken 7LX has the 7 Mc. mobile installation going in fine fashion now and is looking forward to many contacts during May this year, when he will be visiting the three Eastern States.—7LX.

NORTH WESTERN ZONE

The monthly meeting of the North Western Branch was held at the QTH of 7DR at Ulverstone. There was a good attendance of members from Devonport and Burnie. Four new associate members were welcomed. Methods of R.D. Contest scoring was discussed and it was agreed that more information on past contests should be published to enable a new system to be worked out.

In the Burnie municipality the Town Planning Commissioners have adopted new regulations and Amateur Radio Stations have been included as a semi-commercial business. It seems they require someone to explain to them exactly what an Amateur Station really is. We have requested W.I.A. Hobart to arrange interview and impress on the Town Planning that Amateur Radio is a hobby.

A very neat portable transceiver, built by 7JO, was the centre of attraction for quite a number of the members. After the meeting closed an excellent supper was provided by 7DR's XYL.

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PAPUA—NEW GUINEA

This month still sees our President away on leave, but manages to make himself heard from various shacks around Brisbane on 20 mx phone. Our oldest Amateur, 9RC, should now be well and truly established in VK3 and we all look forward to hearing from him and what it is like to be leading a life of ease with a well earned retirement. Several have returned from the big smoke, including 9HI, who showed up on 40 mx phone several Sundays ago, and look forward to hearing you often Les. Roy at 9AU is back with us again, and quickly got back into form by knocking over the DX in his usual brisk manner, contributing his fair share of QSLs to DXCC minded individuals. 9DB also heard in the recent W contest and turning on the heat to the delight of the Ws. He also took up my suggestion and I understand has a very interesting lecture coming up, which had to be postponed due to a.c. power failures in Moresby, so don't forget to roll up on Sundays and get the good oil right from "Double Brandy's" bottle.

9EB still flitting around the country in a fancy Cessna, but occasionally finds time to drop in for a rag chew. Has quite a wealth of gear spread around broadboard fashion, but slowly being confined to a rack and panel. 9RM still chasing DXCC and was and has been recently informed that he is the recipient of the third AJD award. 9TZ very QRL with a big Hydro scheme and at present pondering just how to flume his water race around the side of a 2,000 ft. cliff, but always finds time to drop in on the gang each Sunday morning. 9AS trying to coax a few extra ergs out of his 40 and 20 mx rig with considerable success.

9CW, of the Wau Radio Club, anticipates getting on 20 mx just as soon as some of the junior lads become more familiar with Amateur jargon and procedure, and all striving to be the first to have an overseas QSO on c.w. It is quite surprising just how quickly these lads catch on and we are fortunate in having the local commercial operator to assist in this direction and apparently getting quite a kick out of seeing the way they progress.

So far I have no notes of the activities of the Rabaul boys, and would like to hear of the doings in that neck of the woods, as occasionally they come through on short skip on 20 mx, but not long enough for a solid QSO. Don't forget gang to send in anything of interest up to Wau for incorporation in these notes in order to keep the coverage as broad as possible.

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CORRESPONDENCE

The opinions expressed in these letters are the individual opinions of the writer, and do not necessarily coincide with those of the publishers.

INCREASED POWER ON 144 Mc. AND ABOVE

Editor "A.R.," Dear Sir,

I believe that Federal Executive has from time to time raised with the P.M.G. the question of power increase for VK Hams. My view, sir, is that for bands below 50 Mc. no good purpose would be served by an increase in the legal limit.

However, anyone familiar with the work of W2UK, W4HHK, W1HDQ and others using 1 kw. inputs on 144 Mc., high gain beams, etc., will be aware of the considerable contribution Amateur Radio has made to our scientific knowledge in the past couple of years.

The work I refer to concerns transmission of 2 mx signals over distances of 1,000 miles by the meteor scatter method.

This, however, is not the only contribution Amateur Radio can make to our knowledge. Work on transmission by tropospheric scattering, corelation of v.h.f. communication with our weather patterns, transmission along ducts and so on, can be carried out by the Amateur.

However, it has been demonstrated that for most of this work powers of several hundred watts are necessary. I feel there is a good argument for increase in the legal limit to, say, 500 watts, on bands 144 Mc. and up.

I am quite prepared to go into this matter at greater length if sufficient interest is in evidence.

—I. F. BERWICK, VK3ALZ.

[Federal Executive is always pleased to receive technical data supporting such claims through the member's Divisional Council.—Ed.]

IMPROVING 56-60 Mc. BAND

Editor "A.R.," Dear Sir,

The W.A. Division of the W.I.A. has notified members of the scheme to help Professor H. C. Webster, of the Queensland University during the International Geophysical Year of 1957-58 with reception reports of 56 Mc. activity from "Aurora Polaris" and, we hope, from any other anomalous propagation.

This appeals to me as an excellent scheme and if the results of Amateur communication out of the ordinary can be co-related to Aurora, Met., Sporadic E and goodness knows what else, then work on 56-60 Mc. will be well worth while.

There are a few things that could be done on the band to improve activity and results. Firstly, an increase in power input to the final to 250 watts if required would be a distinct advantage or in any case sufficient increase to enable some of the excellent v.h.f. tubes to be run to capacity.

Secondly, an extensive use of pulse. This would enable long time monitoring of channels to be conducted while waiting for something to break and the use of c.r.o. monitoring for back scatter and the possibility of forward scatter. The pulse could be used for phone for those with sufficient enterprise.

Thirdly, and I consider this to be the most important, open up 56-60 Mc. to the Limited Licencees and let the Z boys have a go at it. It is definitely a phone band and when the DX break-through occurs c.w. is seldom used. Since the Z boys have shown (they have in VK6 anyway) that they can really build gear and get excellent results on 144 and 288 Mc., their addition to the small number active on 56-60 Mc. should do an awful lot of good, and in view of Prof. Webster's appeal, I don't see how we can do otherwise.

So Mr. Editor, if you can bring this to the notice of the Federal Council, perhaps they can do something for the v.h.f. boys throughout Australia and in so doing, hand out a little compensation after giving up 50-56 Mc. to TV without saying boo!

—ROGER CHOATE, VK6RK.

HAMADS

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SALE: Advance Sig. Generator, range 30 Kc. to 30 Mc., as new, £35. BC211AA Freq. Meter, complete incl. reg. power supply, £35. 50 watt Modulator, suits p.p. 807s, incl. 3 power supplies, £25. Type 3 Mk. II., £20. Labgear Wide Band Tuners, 40, 20, 10, new, 30/- ea. VFO's, Meters, Tubes, etc. Enquiries: E. L. Colyer, 20 Burgoyne St., Gordon, N.S.W. (JX 4400).

SALE: A.W.A. Transmitter AT13 r.f. and power supply sections complete with tubes, £85. C. W. Smyth, East Doncaster, Vic. (WJ 1119).

SELL: VP Beam, 14 Mc., all dural plus mtg. and coax 50 ft. (beauty, see Handbook). Bendix Freq. Meter, LM10, with book and pwr. supply. Converted 522 Rx Tx in rack, 6AK5s in Rx plus S meter, pwr. supply and mike, wkg. 2 Xtals. Band-sw. 6146s Tx, 7-14-21-28 Mc., separate VFO, with coax. 6 mx Tx 815 p.a. plus xtal. 6 mx Convtr. (xtal), 12 Mc. i.f. (easily altered for 56 Mc.). Eddystone Bug Key. Eddystone FS1 Mod. Lev. Ind. with 4 coils. Command Rx converted 3.4-7.5 Mc., N/L, AVC, etc. Bendix Rx 1.5 to 9 Mc., 4 bands, converted, extra audio st. (a beauty). Tubes incl. 1625s, 12A6s, cheap. 829B. VFO covers 40, 20, 15, 10 with 6AG7 and VR150 tubes for panel mtg; a perfect little job. 144 Mc. p.a. with QQE06/40 with Eddystone Tx Cond. split-stator 100 pF. per sect. ceramic ends. Lots of other good gear and tubes. No Junk. What you need? All enquiries answered. J. Herd, Box 73, Wangaratta, Vic.

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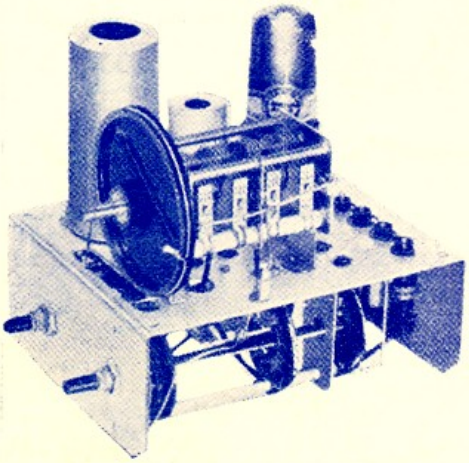

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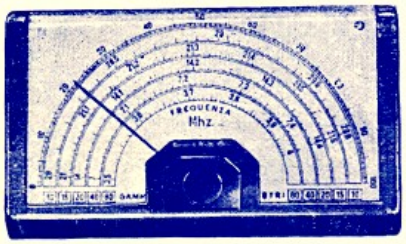

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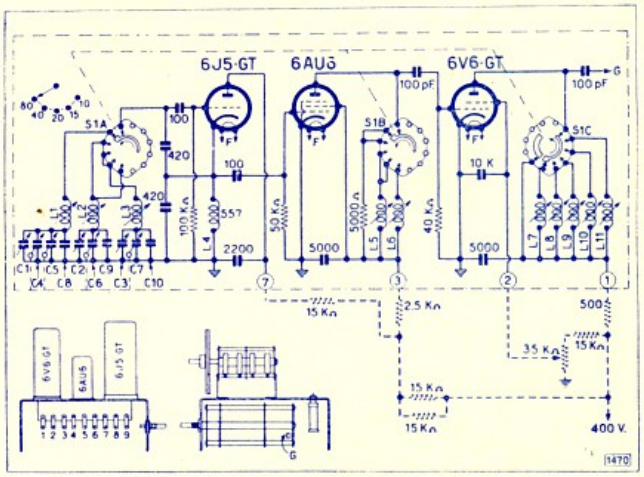

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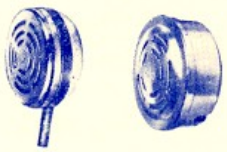

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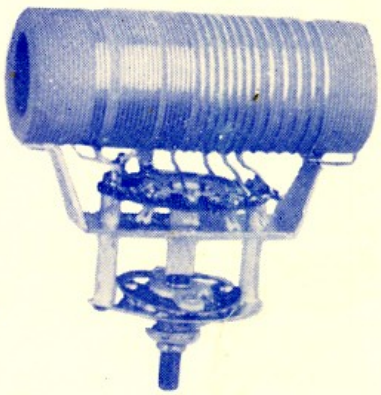

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